TAMIL NADU AGRICULTURAL UNIVERSITY

COIMBATORE

SEVENTEENTH ANNUAL REPORT

APRIL 1, 1987 TO MARCH 31, 1988

BOARD OF MANAGEMENT

Chairman

Vice-Chancellor
Dr. V. Rajagopalan

Members

Commissioner and Secretary to Government, Agriculture Department
Thiru A. Venkataraman, I.A.S.,
(upto 30.11.87)

Thiru D. Murugaraj, I.A.S.,
(from 1.12.87)

Commissioner and Secretary to Government, Finance Department
Thiru C. Ramachandran, I.A.S.,
(upto 30.11.87)

Thiru A. M. Swaminathan, I.A.S.,
(from 1.12.87)

Director of Agriculture
Thiru N. Athimoolam, I.A.S.
(upto 13.12.87)

Thiru V. Viswanathan, I.A.S.,
(from 14.12.87)

Director of Fisheries
Thiru V. Manivannan, I.A.S.,

Director of Animal Husbandry
Dr. C. K. Kalyanasundaram

Chief Conservator of Forests
Thiru S. Kondas, I.F.S.,
(upto 30.4.87)

Thiru S. John Joseph, I.F.S.,
(from 1.5.87)

Agricultural Scientist
Dr. C. R. Muthukrishnan

Crop Farmer
Thiru A. D. Jeyem Pandian

Livestock Farmer
Thiru A. Thisaimani

Nominee for Agro-Industries
Thiru S. James Fredrick, M.Sc. (Ag.)

Woman Social Worker
Thirumathi Rani Ganesh

Educationist
Thiru M. Abdul Rahim

Nominee of I.C.A.R.
Dr. C. Natarajan, Ph.D.
ADG (ICAR)

Member of Legislative Assembly
Thiru P. Anbalagan, M.L.A.,
(upto 29.1.88)

(from 30.1.88 vacant)

Member-Secretary

Registrar
Dr. N. Shanmugam, Ph. D.
(upto 8.3.88)

Dr. A. Narayanan, Ph. D.
(from 9.3.88)

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1. INTRODUCTION

The seventeenth Annual Report of Tamil Nadu Agricultural University covers the period from 1.4.1987 to 31.3.1988. There were significant achievements in the fields of agricultural education, research and extension education. Arrangements were made to start masters degree programmes in Bio - technology, Animal Husbandry Economics and Business Management. Doctoral degree programme in Livestock Production and Management was started this year. To enhance the production potential and profitability of various crops and animal husbandry, improvements in production techniques were brought out in almost all crops and situations. New implements and tools were designed to reduce the working cost and increase efficiency. Techno-economic studies were undertaken covering several farming components like agriculture, horticulture, sericulture, animal sciences, engineering and nutrition. Research activities centred around field problems indentified through close extension-research linkage and interaction among farmers and scientists brought about by several contact programmes. Regional Research Councils and Scientific Workers' Conference were the important forums for identification of areas of research of immediate importance as well as for quick dissemination of information generated during the year. The field problems suggested by various extension functionaries and enlightened farmers were taken up for short and long term investigation as warranted by each entity.

Integrated nutrient management, integrated disease and pest management, bio-technology, bio-energy, farming system research, mixed farming, embryo transfer and upgrading the genetic standard of livestock, preventive and curative measures against diseases in livestock, improving production and profitability in fish farming, designing and development of implements and tools for improving working efficiency and reducing cost of field operations received priority in the allocation of funds and resources.

A strong extension education net work with Krishi Vigyan Kendras, National Demonstration Centres, Plant Clinic Centres, Livestock, Poultry and Sheep Research and Development Centres distributed over the entire Tamil Nadu effectively transmitted the research findings to the farming community and extension agencies. In all the research stations field days and farmers' days were celebrated to provide on - the spot demonstration of various new technologies. These were attended by farmers with growing enthusiasm. Further, the proceedings of most of these occasions were also disseminated through mass media.

The important activities and achievements of the University in the fields of education, research and extension education are summarised below.

Education

* A new post-graduate programme leading to Ph. D in Livestock Production and Management was commenced.
* New courses in Masters Programme in Agricultural Biotechnology, Business Management, Animal Husbandry Economics and Veterinary Extension Education were proposed for the ensuing academic year.
* Sahayathottam Institute of Agriculture and Rural Development, Takkolam, North Arcot district was affiliated to the TNAU for offering a two year diploma course in agriculture.
* Starting an undergraduate degree programme in Dairy Science Technology at Koduvalli near Madras with an admission strength of 20 per year was approved.
* Seven hundred and eighty one students were admitted in the undergraduate courses and 144 students were admitted in the post-graduate courses in the six campuses of the University
* Establishment of a Bio - energy Centre at TNAU, Coimbatore was taken up with the financial assistance from the Ministry of Energy, Government of India.

Research

The following 17 new university schemes and 11 new schemes funded by other agencies like ICAR, Ford Foundation, and Government of India were implemented.

University Schemes

* Strengthening the RRS at Aruppukottai, Srivilliputhur and Pudukottai (NARP)
* Strengthening Horticultural Research Station, Thadiankudisai, (NARP)
* Establishment of Horticultural Research Station, Thirupathisaram. (NARP)
* Scheme for fortification of inbred line of sorghum, Coimbatore.
* Studies on behavioural control of polyphagous insects, Coimbatore.
* Micro propagation of horticultural plants. Coimbatore.
* Suitable strains of *Azospirillum* for commercial crops, Coimbatore.
* Development of model for growth of crop plants, Coimbatore.
* Creation of new Department of Biotechnology, Coimbatore.
* Development of tamarind tree, Paiyur.
* Exploitation of hybrid vigour and development of superior hybrids in redgram, Coimbatore.
* Biological control of soil borne plant pathogens, Coimbatore.
* Studies on the decline in the yield of grapes, banana, tomato and

brinjal due to nematodes and fungi, Periyakulam.

* Improvement of nutritive value of foods utilising specific microbial strains in traditional fermented foods, Madurai.

* Scheme for establishment of Video Library, Coimbatore.

* Research on afforestation of saline soils in Tamil Nadu, Trichy.

* Research on integrated farming systems Coimbatore.

ICAR Schemes

* Isolation and identification of anti-viral principles in plant extracts and preparation of effective antiviral formulations.

* Survey of animal draught power in various agroclimatic zones of the country, its socio-economic features and current husbandry practices

* Breeders seed production in vegetables at Coimbatore.

ICAR Adhoc Schemes

* Studying the impact of modernisation in agriculture in farm women with special reference to farming in the country.

Govt. of India Schemes

* Scheme on machanism of ligno-cellulose degradation in anaerobic digester, purification and fraction-sation, degradation and methanogenesis.

* Establishment of Regional Centre for fuel efficient stove technology.

Other Agency Schemes

* DANIDA-Determinants of selection methodology for farm women in six districts in Tamil Nadu.

* PL.480 Scheme. - Studies on bobble with reference to its possible etiology and structural changes on damaged skin.

* TAC - Ecological studies on treated effluent discharge site of SPIC in Tuticorin.

* Ford Foundation-A study on over-exploitation and working of ground water market

* Ford Foundation - Performance of trained women entrepreurs.

Variety Release

Eleven new varieties of crops were released for general cultivation as noted below :

Rice	:	ADT 39
Ragi	:	CO 13
Blackgram	:	ADT 5
Greengram	:	ADT 3
Horsegram	:	Paiyur 1
Coconut	:	VHC 2
Cotton	:	MCU 11
Brinjal	:	CO 2
Beans	:	TKD 1
Tomato	:	Paiyur 1
Mullai	:	CO 2

Apart from varietal improvement several new technologies were developed for increasing production and profits. They are :

* Pre-emergence application of pendimethalin at 1.25 kg a.i./ha followed by one manual weeding was effective in controlling weeds in rice fields and registered high grain yields at 5.5 t/ha.

* Direct sown rice crop of CO 43 with a population range of 52 to $60/m^2$ and 5-8 productive tillers/hill receiving 100:50:50 kg NPK/ha recorded a high grain yield of 4.3 t/ha.

* In sodic soils, application of gypsum at 50% requirement in combination with 25 kg of $MgSO_4$ and 5t *Vadanarayana* leaf per hectare recorded a grain yield of 3.8 t/ha in Puduvai Ponni as against 1.5 t/ha in control.

* Compacting fluffy soil with eight passes of 400 kg stone roller enhanced root distribution pattern of rice and increased the yield by 25%.

* Rice varieties Ponni and CO 43 were able to tolerate low light intensity while IR 20 was the most susceptible and White Ponni and Bhavani were moderately tolerant.

* Application of neem oil as 2% high volume spray effectively checked rice leaf folder and gall midge incidence.

* High volume application of neem oil at 1-3% or low volume application at 5-10% reduced the brown plant hopper population and earhead bugs.

* Complete protection of rice from rat damage was obtained with low voltage electric fence at Aduthurai.

* Natural large scale outbreak of predatory beetle *Psederus fuscipes* praying on several pests was observed in a few villages in Coimbatore district.

* Carbofuran, phosalone, fenitrothion, monocrotophos, endosulfan, phosphamidon, neem products and butachlor were found to exert no adverse influence on predatory spiders in rice fields.

* Susceptibility to blast disease was found to be high in nine rice varieties raised under partial upland and low-land conditions suggesting need for intensive monitoring followed by suitable remedial measures whenever direct sowing is resorted to.

* Seed treatment of paddy seeds with carboxin or carbendazim 4g/kg followed by foliar spray of edifenphos 0.1% immediately on noticing blast reduced the disease by 59.8 to 69.8% in the nursery.

* A study of leaf extracts from 19 plant species revealed that *Notchi* leaf extract reduced the infection percentage of Rice Tungro Virus to 30 as against 90 in control.

* Critical level of Fe in calcareous soils was assessed at 9.5 ppm. Foliar spray of 1% $FeSO_4$ along with 0.1% citric acid thrice on 30, 45 and 60 DAS was effective in Fe deficient soils and yielded 4.2 t/ha of cholam grains.

- Integrated nutrient management studies on sorghum intercropped with cowpea under dryland conditions indicated that application of 12.5 t of FYM, *Azospirillum* (soil & seed treatment) and 40:40:0 kg NPK/ha were conducive for getting high yields of 2426 kg of sorghum and 88 kg of cowpea per hectare.

- Acaricides Dicofol 18.5 EC, Tetradifon 8 EC and wettable sulphur 80% WP at 1.5, 1.25, and 3.75 kg per hectare respectively gave good control of the mite *Aceria sorghi*.

- A dwarf male sterile line in cumbu, MS 732 A developed by paired crosses was highly resistant to downy mildew disease and used in production of national hybrid MH 179.

- Transplanting five day old maize seedlings was superior to direct seeding recording an increase of 7.70 q / ha and 5.50 q / ha during *kharif* and *rabi* respectively.

- Studies on the response of ragi to micro nutrient indicated that application of 3.5 kg of zinc and 2.5 kg of copper per hectare was optimum.

- In early maturing cultivars of blackgram like T9, application of benzyl adenine at 40 ppm on 45th day induced postponement of senescence and enhanced grain yield by 10%.

- Spraying greengram with buttermilk fermented for 48 hours reduced the incidence of whitefly infestation to 20% against 55% in control (tested with artificial inoculation).

- Pre-emergence application of pendimethalin at 1.0 Kg ai/ha followed by late hand weeding recorded the highest groundnut pod yield of 3682 kg ha.

- Critical period of crop-weed competition for sunflower was estimated to be between 15 and 32 days after sowing at Kovilpatti.

- Desmodium was found to give the highest green manure yield of 12.80 kg per coconut basin of 1.8 m dia around palms.

- Bromadiolone 0.005% and Rodacake 0.025% were found effective baits in controlling rats damaging coconut resulting in 88.2% and 52.0% reduction in damage respectively.

- Pre-emergence application of butachlor at 1.00 kg ai/ha was found effective in the control of most of the black soil weeds.

- Application of NPV @ 450 LE/ha + endosulfan 500 ml/ha along with adjuvants like cotton seed powder 2.5% + jaggery 17.5% reduced *Heliothis armigera* population in cotton as well as the damage caused by the pest.

- A small plant bug called jumping lice (Psyllid) located for the first time in India in 1988 caused extensive damage and set back in subabul plantations.

- Tissue culture work in Ponni rice through anther derivation resulted in the identification of lines with appreciable reduction in duration.

- Decortication of groundnut at 7% moisture was found to be the optimum.

- For the early detection of bunchy top virus in banana, leaf extracts from suspected suckers could be treated with 5 ml of 10% sodium chloride solution and kept overnight. Diseased ones will turn turbid while the healthy ones will remain clear.

- A fertiliser dose of 150 g N, 90 g P_2O_5 and 300 g K_2O/plant in three splits during 3rd, 5th and 7th month increased the net income from Nendran banana to Rs 26,905/ha.

- Rough lemon was found to be a good rootstock for acid lime registering maximum tree height and growth.

- Soft wood grafting with five day old seedling rootstock in cashew recorded 61.7% establishment on the 60th day.

- A new method for rapid multiplication of pepper by inducing rooting on mass filled split bamboo poles planted adjacently and separating each rooted node for establishment as individual vines proved effective and yielded 40 plants annum (from each vine).

- A study on allelopathic effect of tree cover with three species revealed that the mean light intensity was less at 50.5% under *Leucaena* while soil moisture depletion was high under *Eucalyptus* (35%) as against 15% under other trees.

- A power cum manually operated castor sheller capable of shelling 160 kg per hour has been designed and developed.

- A power operated tapioca chipper with absolute safety to the operator was fabricated and tested.

- An electronic metered seed planter for dropping seeds without causing any misses encountered in conventional planters has been developed successfully.

- Irrigating IR 20 rice with continuous ponding at 5 cm level and spraying cycocel at 2000 ppm at active tillering registered the highest grain yield.

- Water use efficiency in maize was maximum in a coimbination of 20 m furrrow length and discharge rate of 10 litres/second.

- A study on acceptance of innovations suggested that adoptian of cent nursery, manual hand weeding and water management were largely adopted while post-harvest technology and use of herbicides were not taken up on a large scale.

Transfer of Technology

The Directorate of Extension Education effectively disseminated advanced technologies developed at the various centres. A summary of the events undertaken is presented below:

- Seven hundred and thirty eight training programmes benefiting 17625 farmers, 5241 extension workers and 1203 students were organised at 19 centres all over the State.

- Fourteen compact block demonstrations and 825 method demonstrations were arranged in 25 centres.

- Farm advisory service benefiting 3794 farmers emerged from 17 units like Krishi Vigyan Kendras, Plant Clinics, Research & Development Centres etc.

- A total of 9602 queries from farmers were answered.

- Mass media utilisation programmes covered 310 print-outs, 310 radio programmes/announcements, 85 TV programmes, 62 leaflets, 47 slide/film shows and 90 exhibitions during the year

- Three hundred farm families were adopted by the six Krishi Vigyan Kendras @ 50 each. Technical guidance and input support were rendered to each of the families in the fields of agriculture, animal husbandry, home science, engineering, sericulture, etc.

- Lessons on fruit cultivation, oilseeds, bio-energy and water management were broadcast through Farm School Programme of the All India Radio benefiting 2824 registered farmers besides other listeners.

- Eight correspondence courses on irrigation, plant protection, dairy farming, poultry, sericulture, banana cultivation, turmeric cultivation and machinery and tools benefited 1[illegible]2 listeners

- Six video programmes covering poultry-keeping, bee-keeping, sericulture, mushroom cultivation, *Azolla* multiplication and coconut wilt were recorded and used for the benefit of farmers and extension workers.

Focus for 1988 - 89

Education

- Starting a degree Programme in Dairy Science Technology.

- Starting of MBA course in agriculture.

- Starting of B.Sc degree Programme in sericulture.

- Strengthening infrastructural facilities for the faculty of Food Science and Nutrition at Madurai.

Research

- Improvement of crop yields and animal production through genetic manipulation.

- Rain water harvesting and management.

- Breeding varieties for stress conditions of drought, soil and water salinity, nutrient deficiency etc.

- Soil health management and integrated nutrient supply for agricultural/horticultural crops.

- Increased plant resistance to pests, diseases, toxins and herbicides.

- Intensification of farming system research.

- Means and methods to reduce human drudgery in agricultural production systems.
- Exploitation of unused and under-exploited tree species.
- Agro-forestry and horticulture in the form of integrated production, processing and marketing systems.
- Integrated fish farming.
- Fresh water prawn farming
- Research on productive and reproductive performance of *Surti* buffaloes.
- Determination of animal feed sources and utilisation of non-conventional feeds
- Technology development for effective participation of rural women in economic transformation.
- Training for women, youth, school drop-outs, fishermen and change agents at lower level.

2. UNIVERSITY ADMINISTRATION

OFFICERS OF THE UNIVERSITY:

Chancellor	: His Excellency Thiru S. L. Khurana, the Governor of Tamil Nadu (upto 13.3.88) His Excellency Dr. P. C Alexander, the Governor of Tamil Nadu (from 14.3.88)
Pro-Chancellor	: Thiru K. Rajaram Hon'ble Minister for Industries and Agriculture (upto 30.12.87) Thiru C. Ponnaiyan Hon'ble Minister for Industries and Agriculture (from 31.12.87 to 29.1.88) Thiru G. V. Ramakrishna, I.A.S., Adviser to His Excellency the Governor of Tamil Nadu (from 30.1.88)
Vice-Chancellor	: Dr. V. Rajagopalan
Registrar	: Dr. N. Shanmugam (upto 8.3.88) Dr. A. Narayanan (from 9.3.88)
Comptroller	: Thiru G. Prabhakaran Nair
Dean, AC & RI, Coimbatore	: Dr. K. G. Shanmugavelu (i/c) (from 1.4.87 to 6.8.87)

	Dr. T. K. Kandaswamy (from 7.8.87)
Dean, AC & RI, Madurai	: Dr. T. Kumaraswami (upto 30.4.87)
	Dr. S. Neelakandan (from 1.5.87 to 4.8.87)
	Dr. T. S. Manickam, (from 5.8.87)
Dean, Madras Veterinary College, Madras	: Dr. P. Kothandaraman (upto 31.1.88)
	Dr. M. P. Arumugam (i/c) (from 1.2.88)
Dean, College of Agricultural Engineering, Coimbatore	: Dr. V. Subramaniyan (upto 29.2.88)
	Prof. K. R. Swaminathan (i/c) (from 1.3.88)
Dean, Post-graduate Studies, Coimbatore	: Dr. V. D. Guruswamy Raja (upto 31.1.88)
	Dr. T. K. Kandaswamy (i/c) (from 1.2.88 to 29.2.88)
	Dr. G. V. Kothandaraman (from 29.2.88)
Dean, Fisheries College, Tuticorin	: Dr. G. Jegatheesan (i/c)
Dean, Agricultural College, Killikulam	: Dr. T. K. Kandaswamy (upto 4.8.87)
	Dr. G. Soundrapandian (from 5.8.87)
Dean, Veterinary College & Research Institute, Namakkal	: Dr. V. Ramamoorthy

Director of Research (Agriculture), Coimbatore	: Dr M Balasubramanian
Director of Extension Education, Coimbatore	: Dr. S. Sankaran (upto 10.8.87 and from 11.8.87 to 8.3.88 additional charge) Dr. N. Shanmugam (from 9.3.88)
Director, School of Genetics, Coimbatore	: Dr. S. R. Sree Rangasamy
Director, Centre for Agricultural and Rural Development Studies, Coimbatore	Dr. A. Kandaswamy
Director of Research (Animal Science), Coimbatore	: Dr. P. Kothandaraman i/c (upto 6.8.87) Dr. T. M. Thangaraj (from 7.8.87 to 29.2.88) Dr. P. Richard Masillamony (from 1.3.88)
Director, Institute of Animal Nutrition, Livestock Research Station, Kattupakkam	: Vacant
Director, Animal Health, Trichirapalli	: Dr. T. M. Thangaraj (upto 6.8.87) Dr. P. Mahalingam (from 7.8.87)
Director, Centre for Plant Protection Studies, Coimbatore	: Dr. S. Jayaraj
Director, Centre for Soil and Crop Management Studies, Coimbatore	: Dr. S. Subramanian (upto 9.8.87) Dr. S. Sankaran (from 10.8.87)

Director, Tamil Nadu Rice Research Institute, Aduthurai	: Dr. S. Chelliah
Director, Water Technology Centre, Coimbatore	: Dr. P. Kandaswamy
Estate Officer, Coimbatore	: Thiru A. Rathinasabapathy

BOARD OF MANAGEMENT

Chairman

Vice-Chancellor	: Dr. V. Rajagopalan

Members

Commissioner and Secretary to Government, Agriculture Department	: Thiru A. Venkataraman, I.A.S., (upto 30.11.87)
	Thiru D. Murugaraj, I.A.S., (from 1. 2.1987)
Commissioner and Secretary to Government, Finance Department	: Thiru C. Ramachandran, I.A.S., (upto 30.11.1987)
	Thiru A. M. Swaminathan, I.A.S., (from 1.12.87)
Director of Agriculture	: Thiru N. Athimoolam, I.A.S., (upto 13.12.87)
	Thiru V. Viswanathan, I.A.S., (from 14.12.87)
Director of Fisheries	: Thiru V. Manivannan, I.A.S.,
Director of Animal Husbandry	: Dr. C. K. Kalyanasundaram
Chief Conservator of Forests	: Thiru S. Kondas, I.F.S., (upto 30.4.87)
	Thiru S. John Joseph, I.F.S., (from 1.5.87)
Agricultural Scientist	: Dr. C. R. Muthukrishnan
Crop Farmer	: Thiru A. D. Jeyem Pandian

Livestock Farmer	Thiru A. Thisaimani
Nominee for Agro-Industries	: Thiru S. James Fredrick, M Sc (Ag.)
Woman Social Worker	: Thirumathi Rani Ganesh
Educationist	: Thiru M Abdul Rahim
Nominee of I C.A R.	. Dr. C. Natarajan, Ph.D. ADG, (ICAR)
Member of Legislative Assembly	: Thiru P. Anbalagan, M.L.A., (upto 29.1.88) (from 30.1.88 vacant)

Member - Secretary

Registrar	. Dr. N. Shanmugam, Ph. D., (upto 8.3 88) Dr. A. Narayanan, Ph. D., (from 9.3.88)

Meetings of the Board of Management

During the year 1987-88, the Board of Management met five times on 3 4 1987, 13.7 87, 16 10.87, 20 1.88 and 14 3 1988

The following were some of the important decisions taken by the Board of Management at these meetings.

Research and Education

The Board considerd and approved the following programmes/schemes

1. Starting of new post-graduate programme leading to Ph.D. in Livestock Production Management at Madras Veterinary College, Madras from the academic year 1987-88.
2. Scheme on comparative studies of sprinkler and drip irrigation methods with conventional surface method [GoI].
3. Establishment of a Regional Centre for fuel efficient stove technology [GOI]
4. Project on determinants of selection methodology for farm women in six districts in Tamil Nadu. [DANIDA]
5. Endowment offered by M / S. Shanthi Trust, Coimbatore for Rs. 50,000/-
6. Institution of the TNAU merit scholarship for the new undergraduate degree programme in B.Sc. (Forestry)
7. Project sponsored by M/S. Tuticorin Alkali & Chemicals to study the ecological features in the treated effluent discharge as a collaborartive research scheme with Fisheies College, Tuticorin.
8. Amendment to the Statutes of the TNAU Act, Statutes, Rules and

Regulations for the inclusion of all Faculty Deans in the Board of Studies.

9. Affiliation of Sahayathottam Institute of Agriculture and Rural Development, Takkolam, North Arcot district to the TNAU for offering two year diploma course in agriculture.

10. Strengthening the Department of Food Science and Nutrition at Agricultural College and Research Institute, Madurai.

11. Starting of new postgraduate degree programmes in the Faculty of Veterinary and Animal Sciences (M.V.Sc., in Animal Husbandry Economics, M.V.Sc., in Extension Education and Ph.D., in Veterinary Surgery) from the academic year 1987-88.

12. Starting of an undergraduate degree programme in Dairy Science Technology at the site of Koduvalli Village in Madras with an admission strength of 20 students per year.

13. Creation of additional staff to the III Phase of Veterinary College and Research Institute, Namakkal from the academic year 1987-88.

14. ICAR project on isolation and identification of antiviral principle in plant extracts and preparation of effective antiviral formulation.

15. PL. 480 scheme-Studies on bobble with reference to its possible etiology and structural changes on damaged skin.

16. Implementation of the new scheme sponsored by M/S. Seshasayee Paper and Boards limited.

17. Ecological studies in the treated effluent discharge site of SPIC in Tuticorin.

18. ICAR New Scheme-Breeders seed production in vegetable, Coimbatore.

19. ICAR Scheme on survey of animal draught power in various agro-climatic zones of the country

20. ICAR adhoc research project for studying the impact of modernisation in agriculture in farm women with special reference to rice farming in the country.

21. Scheme under Ford Foundation-Performance of trained women entrepreneur.

22. Scheme under Ford Foundation - A study on over exploitation and working of ground water market.

23. Increasing the admission strength of M.F.Sc., at Fisheries College, Tuticorin from 5 to 10 seats.

24. Proposals to the teachers of TNAU to do their Ph.D. as part time scholars in other conventional universities and also to act as members of the Advisory Committee of other colleges without prejudice to normal work subject to a ceiling to be prescribed.

25. Establishment of the Planning, Development and Evaluation Cell in the University.

26 Establishment of Bio-Energy Centre at Tamil Nadu Agricultural University, Coimbatore with the financial assistance from Ministry of Energy, Government of India.

27. New Plan Schemes from 1988-89 for Rs. 16.24 lakhs in the faculties of agriculture, veterinary and fisheries.

28. Government of India Scheme on mechanism of lignocellulose degradation in anaerobic digesters, purification, fractionation, degradation and methanogenesis.

29 ICAR project for breeder seed of annual oilseed crops-Groundnut seed production centre, Vridhachalam.

30. ICAR scheme for capital requirement for modernisation of Indian agriculture at Coimbatore.

31 Scheme on DPAP-Enhancement of genetic potentiality of local breed of sheep by introducing cross bred rams of exotic origin.

32. Collaborative research project with IRRI on differential impact of modern rice technology.

33. The collaborative programme between TNAU and E.T.C. Foundation, Holland.

34. Approved the master plan (1987-2000) comprising agriculture, horticulture, animal sciences, fisheries etc., for agricultural biotechnology research programmes.

35. Approved for sending Rs. 25,000 to "Freedom 40 Years Inter-University Meet" by the Tamil Nadu Agricultural University to the Government of Tamil Nadu.

Administration

The Board approved the following

1. Approved the Government letter dated 19.5.1987 for adoption in case of recruitment of Assistant Professors appointed after 10.1.79 for higher posts of Associate professors

2. Approved the proposal for sending Agenda of Board of Management through circulation and suitable amendment has been approved in the Statutes of the Tamil Nadu Agricultural University.

3. Approved the amendment as proposed by the Government giving exemption to acquire Ph D. degree in the concerned subject till 9.1.1990 for the existing staff of those working as on 10.1.1979.

4. Approved the delegation of powers to the Vice-Chancellor for taking persons, both teaching and non-teaching, on deputation with the Tamil Nadu Agricultural University for four years in general and upto five years under special circumstances.

5. Approved the delegation of powwers to the Vice-Chancellor for the appointment of Deputy Wardens upto 5th year under special circumstances.

6. Approved the revised qualification for the post of Physical Director

in the colleges of the Tamil Nadu Agricultural University.

7. Approved the Government order for adoption in the University on reservation of appointment of handicapped persons for all future recruitments.

8. Approved the Government order enhancing the limit of earned leave from 180 days to 240 days at credit at a time to the employees of the Tamil Nadu Agricultural University.

9. Approved the revised qualification for the Computer Section of the Tamil Nadu Agricultural University.

10. Approved the 15th and 16th Annual Reports for the years 1985-86 and 1986-87 of the Tamil Nadu Agricultural University respectively.

11. Approved the Government order duly relaxing the qualification of Ph.D. to recruit Assistant Professors with Master's degree upto 9.1.1989.

BUDGET

1. Approved the audited annual accounts for 1985-86 of the Tamil Nadu Agricultural University.

2. Approved the Government Order for adoption of the House Building Advance and Special Family Benefit Scheme.

3. Approved for the payment of Pension/Family Pension on the last working day of the month.

4. Approved to place the surplus money held in the University under Provident Fund Account with the Tamil Nadu Transport Development Finance Corporation Limited under Fixed Deposit Scheme.

5. Approved the audit report of the Tamil Nadu Agricultural University for the year 1985-86.

6. Approved the purchase of video equipments at a cost of Rs 4.12 lakhs

CIVIL WORKS

1. Approved the engaging of the Government Architect, Public Works Department for the preparation of preliminary drawings, detailed drawings, preparation of estimates and the master plan for the Veterinary College and Research Institute, Namakkal.

2. Sanctioned Rs. 5.00 lakhs for the construction of additional kitchen cum dining hall No. II in Agricultural College, Killikulam.

3. Approved the panel of Architects Government Architect, Public Works Department for the Tamil Nadu Agricultural University civil works upto 31.3.1990.

4. Sanctioned Rs. 10.00 lakhs for the construction of additional Lecture Hall No. II in Agricultural College, Killikulam.

5. Sanctioned Rs. 2.70 lakhs for two laboratory buildings in Veterinary College and Research Institute, Namakkal in the Government Veterinary Hospital Complex area.

Education

1. The following new post-graduate degree programmes were approved

   I. Ph.D. in Veterinary Surgery at the Madras Veterinary College, Madras.

   II. M.V.Sc. in Extension Education at the Madras Veterinary College, Madras.

   III. M.V.Sc., in Animal Husbandry Economics at the Madras Veterinary College, Madras.

2. Granted affiliation to Pandit Jawaharlal Nehru College of Agriculture at Karaikal establised by the Government of the Union Territory of Pondicherry to offer a four year degree course leading to B.Sc. (Ag.) from the Academic year 1987-88.

3. The Sagayathottam Institute of Agriculture and Rural Development, Takkolam, North Arcot district was granted affiliation for offering a two-year diploma course in agriculture.

4. The academic activities and infrastructural facilities at the third Agricultural College at Killikulam, Tirunelveli district for the IV Phase have been strengthened.

5. The academic activities and infrastructural facilities at the second Veterinary College and Research Institute at Namakkal for the III Phase have been strengthened.

Under the Internal Deputation Programme, four teachers have been deputed for doing their Master's Degree in agriculture in this University.

ACADEMIC COUNCIL

Chairman

Vice-Chancellor	:	Dr. V. Rajagopalan

Members

Commissioner and Secretary to Agriculture Department	:	Thiru A. Venkataraman, I.A.S., (upto 30.11.87)
		Thiru D. Murugaraj, I.A.S., (from 1.12.1987)

Deans

AC & RI, Coimbatore	:	Dr. K. G. Shanmugavelu (i/c) (from 1.4.87 to 6.8.87)
		Dr. T. K. Kandaswamy (from 7.8.87)

AC & RI, Madurai	: Dr. T. Kumaraswami (upto 30.4.87)
	Dr. S. Neelakandan (i/c) (from 1.5.87 to 4.8.87)
	Dr. T. S. Manickam, (from 5.8.87)
Agricultural College, Killikulam	: Dr. T. K. Kandaswamy (upto 4.8.87)
	Dr. G. Soundrapandian (from 5.8.87)
College of Agricultural Engineering, Coimbatore	: Dr. V. Subramaniyan (upto 29.2.88)
	Prof. K. R. Swaminathan (i/c) (from 1.3.88)
Madras Veterinary College, Madras	: Dr. P. Kothandaraman (upto 31.1.88)
	Dr. M. P. Arumugam (i/c) (from 1.2.88)
Fisheries College, Tuticorin	: Dr. G. Jegatheesan (i/c)
Post-graduate Studies, Coimbatore	: Dr. V. D. Guruswamy Raja (upto 31.1.88)
	Dr. T. K. Kandaswamy (i/c) (from 1.2.88 to 29.2.88)
	Dr. G. V. Kothandaraman (from 29.2.88)
Faculty of Horticulture	: Dr. K. G. Shanmgavuelu

Directors

Director of Research (Agriculture), Coimbatore	: Dr. M. Balasubramanian

Director of Research (Animal Science), Coimbatore	:	Dr. P. Kothandaraman, i.c (upto 6 8.87)
		Dr. T. M. Thangaraj (from 7.8.87 to 29.2.88)
		Dr P Richard Masilamony (from 1 3.88)
Director of Extension Education, Coimbatore	:	Dr. S. Sankaran (from 16.4.88 to 10.8.87) (from 11.8.87 to 8.3 88 (i c)
		Dr. N. Shanmugam (from 9.3.88)
Director, CARDS, Coimbatore	:	Dr. A. Kandaswamy
Director, School of Genetics, Coimbatore	:	Dr. S. R. Sree Rangasamy
Director, Water Technology Centre, Coimbatore	:	Dr. P. Kandaswamy
Director, Centre for Plant Protection Studies, Coimbatore	:	Dr. S. Jayaraj
Director, Centre for Soil and Crop Management Studies, Coimbatore	:	Dr. S. Subramanian (upto 9.8.87)
		Dr. S. Sankaran (from 10.8.87)
Director, Animal Health, Trichirapalli	:	Dr. T. M. Thangaraj (upto 6.8.87)
		Dr. P. Mahalingam (from 7.8.87)
Director, Tamil Nadu Rice Research Institute, Aduthurai	:	Dr. S. Chelliah

Six members among the Heads of Departments nominated by the Vice-Chancellor.

Prof. K. R. Swaminathan
Professor and Head
Department of Bio-energy
College of Agricultural Engineering
Coimbatore

Dr. V. Meenakshisundaram
Professor and Head
Department of Agricultural Economic
Coimbatore

Dr. N Ragavan
Professor and Head
Department of Preventive Medicine
MVC, Madras

Dr. K. Venkataramanujam
Professor and Head
Department of Fish Culture
Fisheries College
Tuticorin

Dr. I Irulappan
Professor and Head
Department of Horticulture
Agricultural College & Research Institute, Madurai

Dr. V. Gnanaprakasam
Professor and Head
Department of Therapeutics
MVC, Madras

Three members having special knowledge or practical experiance in different aspects of agriculture nominated by the Vice-Chancellor.

Dr J Subbayya
Dean (Agri)
Andhra Pradesh Agricultural University, Rajendranagar
Hyderabad

Dr. R. C Maheswari
Project Co-ordinator
Research Scheme, Central Institute of Agricultural Engineering
Shri Guru Tegh Bahadur Complex
T. T. Nagar Bhopal.

Dr. B. U. Rao
Joint Director
Indian Vetrinary Research Institute
H. A. Farm
Hebbal, Bangalore

Secretary

Registrar
Dr. N. Shanmugam
(upto 8.3.88)

Dr. A. Narayanan
(from 9.3.88)

Meetings of the Academic Council

The Academic Council met twice during the period under report. The following important decisions were taken.

Accepted the creation of additional staff to the III Phase of Veterinary College and Research Institute, Namakkal.

Accepted the proposal on the starting of an under - graduate degree programme in Dairy Science Technology.

Accepted the proposal on strengthening the Department of Food Science and Nutrition at the Agricultural College and Research Institute, Madurai.

Accepted the proposal on the upgradation of Poultry Research and Development Centre, Namakkal as Institute of Poultry Science.

Accepted the proposal for the establishment of Department of Agricultural Journalism in the University.

Accepted to consider the request of certain employees transferred to the Tamil Nadu Agricultural University for a change of discipline according to their postgraduate qualification.

Accepted the affiliation of Sagayathottam Institute of Agriculture and

Rural Development, Takkolam, North Arcot district to the Tamil Nadu Agricultural University for offering a two year diploma course in agriculture.

Accepted the reallocation of Tamil Nadu Agricultural University merit scholarship among the campuses.

Accepted the institution of Tamil Nadu Agricultural University merit scholarship for the new under-graduate degree programme, B.Sc (Forestry).

Accepted the proposal on the creation of Planning, Development and Evaluation Cell in the University

Accepted new plan schemes for 1988-89 under agriculture, veterinary and animal sciences and fisheries.

Accepted the proposal for the collaborative research project with IRRI on differential impact of modern rice technology.

Accepted the report of the Task Force Committee on the vegetable research work at Tamil Nadu Agricultural University.

Accepted the request of the employees of Tamil Nadu Agricultural University to do their Ph.D. as part-time scholars in other oonventional universities and permit employees to be member of Advisory Committee of other colleges and offer their advice in research assignment.

Accepted the proposal to increase the admission strength of M F.Sc., at Fisheries College, Tuticorin from 5 to 10.

Accepted the academic robes at the Convocation for the postgraduate degree programme leading to M.Sc. (Horticulture) and undergraduate degree programme leading to B.Sc. (Forestry).

Accepted the proposal on the creation of FAO Endowment in Plant Protection for Guest lectures.

Accepted the proposal on the establishment of Bio - Energy Centre at Tamil Nadu Agricultural University, Coimbatore fully financed by the Ministry of Energy, Government of India.

BOARD OF STUDIES

The Board of Studies in Agriculture, Agricultural Engineering, Veterinary and Animal Science, Horticulture and Fisheries Science constituted during the year 1987 continued during the period under report. Each Board of Studies consisted of the following members :

1. Dean of the faculty (Chairman)
2. Other Deans within the faculty
3. Heads of Departments of the concerned faculty.
4. All the Professors of the faculty.
5. Two elected representatives from among the Associate Professors and four from among the Assistant Professors.
6. Two experts in the concerned subjects from outside the University nominated by the Vice-Chancellor.

Faculty of Agriculture

Elected Members

Associate Professors

1. Dr. C. Ramaswamy
   Associate Professor
   Dept. of Agrl. Economics
   Tamil Nadu Agrl. University
   Coimbatore
   (upto 25.3.88)

2. Dr. K. Ramaswamy
Associate Professor
(Agrl. Microbiology)
NPRC, Vamban
(from 26.3.88)

3. Thiru N. Sivaswamy
Associate Professor (Agrl. Botany)
Agrl. College & Research Institute,
Coimbatore.
(upto 25.3 88)

4. Dr. M Govindaswamy
Associate Professor
Dept. of Soil Science & Agrl.
Chemistry
AC & RI, Madurai.
(from 26.3.88)

Assistant Professors

1. Thiru M N. Budhar
Asst. Professor (Agronomy)
RRS, Paiyur.
(upto 25.3.88)

2. Thiru K. Ponnuswamy
Assistant Professor (Agronomy)
NPRC, Vamban
Pudukkottai.
(upto 25.3.88)

3. Thiru R. Murugesan
Asst. Professor (Agrl. Microbiology)
NPRC, Vamban,
Pudukkottai.
(upto 25.3.88)

4. Thiru S. Ramaswamy
Assistant Professor
TRRI, Aduthurai
(upto 25.3.88)

5. Thiru P. Paramasivam
Assistant Professor
Dept. of Soil Science and
Agrl. Chemistry, AC & RI.,
Madurai
(from 26.3 88)

6. Thiru. S. Chellamuthu
Assistant Professor
Dept. of Soil Science and
Agrl. Chemistry, Coimbatore
(from 26.3.88)

7. Thiru C. Natarajan
Assistant Professor
Plant Breeding & Genetics,
NPRC, Vamban,
(from 26.3.88)

8. Thiru I. Mohammed Iqbal
Assistant Professor
KVK, Vridhachalam,
(from 26.3.88)

Nominated Members

1. Dr. R Ramanna
Director of Instruction (Agri.) (i/c)&
Professor and Head,
Dept. of Agrl Economics,
University of Agrl. Sciences
GKVK Campus,
Bangalore.
(upto 25.3.88)

2. Dr. S Chandrasekaran
Professor and Head,
Dept. of Soil Science
Annamalai University,
Annamalai Nagar.
(upto 25.3 88)

3. Dr. M. M. Koshy
Dean
College of Agriculture,
Vellayani, Trivandrum.
(from 26.3.88)

4. Dr. M. Sugunakar Reddy
Principal,
College of Agriculture,
Rajendranagar,
Hyderabad.
(from 26.3.88)

Meetings

The Board of Studies met twice during the year under report and recommended the following to the Academic Council

1. To conduct supplementary examination during trimester break and summer vacations
2. Introduction of progress report for supplementary students.
3. Evaluation procedure for library assignment in lieu of study tour.
4. Inter-faculty representation in the Board of Studies
5. To include all faculty Deans as members of other Board of Studies

Faculty of Agricultural Engineering

Elected Members

Associate Professors

1. Dr. V. V. Sreenarayanan
Associate Professor
Department of Agrl Processing
College of Agrl. Engineering
TNAU, Coimbatore.
(upto 25.3.88)

2. Thiru P. Natarajan
Associate Professor
Dept. of Agrl Structures
College of Agrl. Engineering
TNAU, Coimbatore.
(upto 25.3.88)

3. Thiru M. Kotteeswaran
Associate Professor
Dept. of Soil & Water Conservation
CAE, Coimbatore.
(from 26.3.88)

4. Dr. M. Balasubramanian
Associate Professor
Dept. of Agrl. Processing
CAE, Coimbatore.
(from 26.3.88)

Assistant Professors

1. Thiru D. Manohar Jesudas
Assistant Professor
Dept. of Farm Machinery
CAE, Coimbatore.
(upto 25.3.88)

2. Thiru K. Shanmugasundaram
Assistant Professor
Dept. of Agrl. Engineering
AC & RI., Madurai.

3. Thiru S. Senthilvel
Assistant Professor
Dept. of Soil & Water Conservation
CAE, Coimbatore.
(upto 25.3.88)

4. Thiru V. Kumar
Assistant Professor (Agrl. Engg)
Regional Research Station
Paiyur.
(upto 25.3.88)

5. Thiru M. Singaravelu
Assistant Professor
Dept. of Agrl. Processing
(from 26.3.88)

6. Thiru K. P. Rajendran
Assistant Professor
Dept. of Agrl. Structures
CAE, Coimbatore.
(from 26.3.88)

7. Thiru M. V. Rangaswamy
Dept. of Agrl. Structures
CAE, Coimbatore.
(from 26.3.88)

Meetings

The Board of Studies met once during the year under report and recommended the following to the Academic Council.

1. Modalities for implementation of items of work for Village Stay Programme for B.E. (Ag) students.
2. Approval of revised syllabus for ENG 401 Development Education (1+0) as ENG. 401 Development Education (2+0).
3. Proposal to introduce a course for undergraduate students in Physical Education
4. Institution of fellowship in the ICAR pattern in the faculty of Agricultural Engineering.

Faculty of Veterinary and Animal Science

Elected Members

Associate Professors

1. Dr. S. Jayasundar
   Associate Professor
   Dept. of Pharmacology
   MVC, Madras.
2. Dr. R. Natanam
   Associate Professor
   Dept. of Animal Nutrition
   MVC, Madras.

Assistant Professors

1. Dr. D. Kathiresan
   Assistant Professor
   Deptartment of Obstetrics and Gynaecology
   MVC, Madras.
2. Dr. K. A. Duraiswamy
   Assistant Professor
   Livestock Research Station
   Kattupakkam
3. Dr. S. N. Sivaselvam
   Dept. of Animal Husbandry - Economics
   MVC, Madras-7
4. Dr. N. Daniel Joy Chandran
   Assistant Professor
   Livestock Research Station
   Kattupakkam.

Nominated Members

1. Dr. C. V. Reddy
   Dean
   Faculty of Vety. Science
   Andhra Pradesh Agrl. University
   Hyderabad
2. Dr. A. Ramakrishnan
   Director
   Centre of Advance Studies (Poultry)
   Kerala Agricultural University
   Mannuthy, Trichur

Meetings

The Board of Studies met once during the year under report and recommended the following to the Academic Council.

1. Revised curricula and syllabi for M.V.Sc., degree programme
2. Revised curricula and syllabi for Ph.D., degree programme.
3. To start Ph.D. programme in Livestock Production and Management.
4. Revised curricula and syllabi for undergraduate programme.

5. Separate registration card for supplementary examination.

6. Allowing only 21 credits for the supplementary examination.

7. Introduction of a course in Physical Education for the undergraduate students

8. Offering a new course entitled 'Development Education'.

9. Starting of M.V.Sc. degree programme in Animal Husbandry Economics, Extension Education and Veterinary Surgery.

Faculty of Horticulture

Elected Members

Associate Professors

1. Dr. R. Subbiah
Associate Professor
Department of Horticulture
AC&RI Madurai
(upto 23 1.88)

2. Dr. C. M. Pappaiah
Associate Professor
Department of Horticulture
AC&RI, Madurai
(upto 24.1 88)

3. Thiru S. Thamburaj
Associate Professor
Faculty of Horticulture
TNAU, Coimbatore
(upto 24.1.88)

Assistant Professors

1. Thiru M. Kannan
Assistant Professor (Hort)
Hort. Res. Station
Yercaud.

2. Thiru N. Selvarajan,
Assistant Professor (Hort)
Agrl. College, Killikulam.

3. Thiru N. Cheziyan
Assistant Professor (Hort)
Faculty of Horticulture
TNAU, Coimbatore.

4. Thiru S. Jayasankar
Assistant Professor (Hort)
Faculty of Horticulture
TNAU, Coimbatore

Nominated Members

1. Dr. S. N. Rao
Chairman
Andhra Pradesh Forest Devt.
Corporation Limited
N. M. D. C. Buildings
Sixth Floor, MaSab Tank,
Hyderabad
(upto 23.1.88)

2. Dr. M. Aravindakshan
Director of Research
College of Horticulture
Kerala Agrl University
Vellanikkara, Trichur.
(from 24.1.88)

3. Dr. P. G. Sivaraman Nair, Ph.D.,
Director of Research,
Kerala Agrl University,
Vellanikkara, Trichur
(upto 23.1.88)

4. Dr U. G. Nalwadi
Director of Students Welfare
University of Agrl Sciences
Krishnagar Campus
Dharwad 580005.
(from 24 1.88)

Meetings

The Board of Studies met once during the year under report and recommended the following to the Academic Council:

1. Introduction of course in Physical Education for undergraduate studies.
2. Revised syllabus for the course Development Education.
3. Restriction of number of courses for supplementary examination
4. Evaluation procedure for library assignment in lieu of study tour.
5. Institution of fellowship in the ICAR pattern in the faculty of Horticulture

Faculty of Fisheries

Elected Members

Associate Professors

1. Dr. P. Selvaraj. Associate Professor
   Fisheries College, Tuticorin
2. Dr. V. Sundararaj,
   Associate Professor
   Polyculture Scheme, Vedaranyam
   (upto 28.1.88)
3. Dr. R. Santhanam,
   Associate Professor
   Fisheries College, Tuticorin
   (from 29.1.88)

Assistant Professors

1. Dr. SP. Palaniappan
   Assistant Professor
   Fisheries College, Tuticorin
   (upto 28.1.88)
2. Dr V. Ramadass
   Assistant Professor
   Fisheries College
   Tuticorin
   (upto 28.1.88)
3. Thiru T. K Sundaram
   Assistant Professor
   Fisheries College
   Tuticorin
   (upto 28.1.88)
4. Dr. B Srikrishna Dhass,
   Assistant Professor
   Dept. of Fish Culture
   Fisheries College
   Tuticorin.
5. Dr P. Gopalakrishnan,
   Assistant Professor
   Dept. of Fish Culture
   Fisheries College, Tuticorin
   (from 29.1.88)
6. Dr. N. Sukumaran,
   Assistant Professor
   Dept. of Fish Culture
   Fisheries College, Tuticorin
   (from 29.1.88)
7. Dr. V. K. Venkatarmani
   Assistant Professor
   Fisheries College
   Tuticorin
   (from 29.1.88)

Nominated Members

1. Dr. C. T. Samuel
   Professor and Head
   Dept. of Industrial Fisheries
   University of Cochin,
   Cochin
   (upto 28.1.88)

2. Prof. R. K. Salian
Head of Division (Fisheries Science)
College of Fisheries
University of Agrl. Sciences
Bangalore
(upto 28.1.88)

3. Prof. K. C. Bose
Dean, Fishery Engineering,
College of Fisheries
Orissa University of Agriculture
and Technology
Bhuvaneswar
(from 29.1.82)

4. Dr. T. J. Varghese
Professor of Agriculture
College of Fisheries
University of Agrl. Sciences
Bangalore.
(from 29 1 88)

Meetings

The Board of Studies met once during the year under report and recommended the following to the Academic Council.

1 Introducing elevan trimesters with one month Village Stay Programme to B. F. Sc on par with B. Sc (Agri), B. Sc (Hort) etc.

2. Revision of syllabus for B. F. Sc for 11 trimesters.

3. Evaluation procedure for Village Stay Programme.

4. Introducing course in Physical Education as compulsory

5. Introducing the three letter coding system for the B. F. Sc., degree programme.

Recognition Committee

The Recognition Committee met once during the year under report and recommended the following to the Academic Council.

1. Considered the following degrees for recognition for admission to the post-graduate degree courses of Tamil Nadu Agricultural University.

Name of the University	Name of the degree
Somalia National University, Somalia	LUREA (B.Sc.)
Sind Agricultural University, Tanjdojam	B.E. (Ag)

2. Recognition of the certificate of ESLCE awarded by the Addis Ababa University and Pre-degree of Gandhi University, Kottayam, Kerala for the purpose of admission to the undergraduate degree programmes of Tamil Nadu Agricultural University.

Board of Examination

The Board of Examination met once during the year under report. The following decisions were taken.

1. Approved the results of the II semester (1986-87 batch) and IV semester (1985-86 batch) of Diploma in Agriculture of Sri Ramakrishna Mission Vidyalaya.

2. Accepted the schedule of action for the conduct of semester examination of Diploma in Agriculture for adoption in future.

3. Ratified the appointment of the external examiners for the IV (1985-86 batch) and II (1986-87 batch) semester examinations of Diploma in Agriculture of Sri Ramakrishna Mission Vidyalaya.

4. Resolved to prepare a short list for the appointment of external examiners and question paper setters for all the semester examinations of Diploma in Agriculture.

Courses and Curricula

The trimester system of education was followed for the under-graduate and post-graduate degree programmes and Ph D programmes of all disciplines in the University.

A total of 9589 application forms for the degree courses in Agriculture, Horticulture, Veterinary Science, Agricultural Engineering and Fisheries and 38 applications for B Sc. (Home Science) were received.

With regard to post-graduate programmes, 284 applications were received for Master's Degree Programmes. Selection for the postgraduate programmes was made after interviewing the candidates by the different Selection Committees appointed by the Vice-Chancellor.

The details of enrollment and outturn in the different degree programmes are furnished below :

Degree Programme	No. of students admitted	No. of students passed out
B.Sc. (Ag)	338	202
B.Sc. (Hort)	60	47
B.V.Sc.	226	104
B.E. (Ag)	103	74
B.Sc. (Home Science)	17	9
B.F.Sc.	18	17
B.Sc (Forestry)	19	—
Total	781	453
Post-graduate		
M Sc. (Ag)	107	223
M Sc (Hort)	14	16
M.E. (Ag)	—	—
M.Sc. (Food Science)	4	4
M.V.Sc.	19	43
M.F.Sc.	—	—
Total	144	287
Ph D (Agriculture)	—	22
Ph D. (Horticulture)	—	3
Ph D. (Veterinary Science)	—	20
Total	—	45
Grand total	925	785

Semester system of education was followed in the affiliated institutions of the Tamil Nadu Agricultural University offering Diploma Course in Agriculture.

The following semester examinations for the students of Diploma in Agriculture offered by Sri Ramakrishna Mission Vidyalaya were conducted during the period under report.

Semester	Batch	Date of examination	Date of declaration of results
IV	1985-86	25.5.87	20.7 87
II	1986-87	25.5 87	20.7.87

Details of fellowships awarded during the year under report

Master's Degree

	Name of the Scholarship/Fellowship	Amount	No of persons	Year/Period
1	M/S. Coromandel Indag Products	Rs. 25000/-	1	For two years
2.	Indian Cardamom Research, Kerala	Rs. 25000/-	1	-do-
3.	IEL Ltd., Cardamom Board Fellowship	Rs. 25000/-	1	-do-
4	Pyrites Phosphates and Chemicals Limited, New Delhi	Rs. 25000/-	1	-do-

Ford Foundation Fellowship

The Fellowship was sanctioned to twelve postgraduate women students of 1986-87, at the rate of Rs. 400/- p.m for two years with a contingent grant of Rs. 1500 - and a book allowance of Rs 500/-.

TNAU Merit Scholarship

TNAU Merit Scholarship was sanctioned to 10 MVSc. students, 33 M.Sc. (Ag) students, three M.Sc. (Hort) students, three M. E. (Ag.) students and one M.F.Sc. student at the rate of Rs. 200/- p.m. for 10 months in an academic year.

Seminars/Symposia Workshops/ Conferences

The first all India small millet workshop was held at TNAU, Coimbatore under the auspices of the Indian Council of Agricultural Research and the School of Genetics, TNAU from 20th to 22nd April, 1987.

The State level Plant Protection Workers' Meet was held at TNAU, Coimbatore from 18th to 21st May, 1987.

A six day international workshop on botanical pest control in rice - based cropping systems was inaugurated by Dr. V. Rajagopalan, Vice-Chancellor of TNAU, Coimbatore on June, 1987.

An ICAR sponsored Summer Institute on water resource management in command areas was conducted from June 23 to July 2, 1987 by the Scientists of Water Management Scheme, Agricultural College and Research Institute, Madurai.

A seminar on mushroom cultivation was organised at Madras on July 16, 1987 by the Indian Bank in collaboration with TNAU, Coimbatore.

A two-day under-graduate Teaching Seminar was held on July 17 and 18, 1987 at TNAU, Coimbatore.

A two day workshop on Status Report preparation for different agro-climatic zones of Tamil Nadu was conducted at TNAU, Coimbatore on July 29, 1987.

The Centre for Plant Protection Studies and the Directorate of Extension Education, Coimbatore jointly conducted a workshop on biological control of pests and plant pathogens of crops for 21 Agricultural Officers of the State Departments of Agriculture and Oilseeds from 14th to 18th September, 1987. Padmashri Dr J. S. P. Yadav, Research and Educational Advisor of the USAID programme, New Delhi participated in this workshop.

The Directorate of Plant Protection (Quarantine and Storage) of Government of India, Tamil Nadu Department of Agriculture and TNAU, Coimbatore conducted the Second Annual Meet of Pesticide Analysts during September 24-25, 1987.

Dr G. V. Chalam Memorial Lecture was held at TNAU, Coimbatore on November 3, 1987. Dr Gurdev S. Khush Principal Plant Breeder and Head, Plant Breeding Department, IRRI, Manila delivered the special lecture on Rice Breeding Accomplishments and Challenges.

Dr V. Rajagopalan, Vice Chancellor TNAU inaugurated the five day introductory workshop of the Project 'Tamil Nadu Women in Agriculture', at Coimbatore on November 9, 1987.

A national seminar on mineralogy of potassium in relation to crop responses was organised at Agricultural College & Research Institute, Madurai on November 11, 1987.

A national seminar on management of plant diseases with plant products / Biological agents sponsored by the ICAR and TNAU was held at Agrl. College & Research Institute, Madurai an January 11 and 12, 1988.

National workshop on *Heliothis* was held on February 18 and 19, 1988. Dr M. V. Rao, Special Director General, ICAR and Thiru A. Viswanathan, I.A.S., Director of Agriculture participated.

The state level Scientific Workers' Conference in Fisheries was held at the Fisheries College, Tuticorin on February 26, 1988.

Trainings Farmers' Days

A 15-day training programme for fisherwomen on fish processing concluded on April 22, 1987 at the Fisheries College, Tuticorin.

The Department of Agricultural Extension and Rural Sociology, TNAU organised an exhibition from 2nd to 4th May, 1987 highlighting the environmental awareness and education at the first flower show held at Kotagiri.

An one-day training on production technology of oyster mushroom was conducted on May 5, 1987 by the Department of Plant Pathology, TNAU, Coimbatore.

Farmers' Day was celebrated at Cotton Research Station, Srivilliputhur on May 22, 1987.

An exhibition focusing on the environmental awareness and education was organised by the Department of Agricultural Extension and Rural Sociology, TNAU, Coimbatore on June 7, 1987 during the 31st fruit show held at Coonoor

A training programme on social forestry was organised for the Extension Officers (Social Forestry) and Assistant Project Officers (Farm Management) at Forestry Research Station, Mettupalayam from 1st June, 1987 to 31st August, 1987.

The Department of Agrl. Extension and Rural Sociology TNAU, Coimbatore participated in the World Environment Protection Day at Mettupalayam on June 17, 1987. Thiru N. Govindan, I.A.S. Coimbatore District Collector declared open the environment exhibition.

A training programme on pest and disease surveillance in horticultural crops and management of pests and diseases was conducted for the extension personnel of the State Department of Horticulture and Plantation Crops on July 6, 1987 at Uthagamandalam by the Scientists of TNAU, Coimbatore

A training programme was conducted on seed health and plant protection in seed crops and seed storage at the Soil Salinity Research Centre, Trichy from 6th to 9th July, 1987.

A special training on mushroom cultivation for the members of Women's Voluntary Service, Coimbatore was conducted on July 13, 1987 by the Department of Plant Pathology, TNAU, Coimbatore.

Six Plant Protection Officers from the Plant Protection Institute, Hanoi were given training at TNAU, Coimbatore from 13th to 27th July, 1987

A one-day contact programme of the Farm School on All India Radio on micronutrient fertilization was conducted by the Communication Centre, Coimbatore on July 31, 1987.

The training unit of the Directorate of Extension Education organised a three day training programme for the Master Trainers on crop protection and agrl. extension at TNAU, Coimbatore from August 3, 1987.

A one-day contact programme of the Farm School on All India Radio on allied occupation in agriculture was conducted by the Directorate of Extension Education at KVK, Madurai on August 26, 1987.

An intensive field training on integrated pest management on rice was organised by FAO at TRRI, Aduthurai from 4th to 11th September, 1987

A training on fish processing for 15 fisher-women was organised from 16th to 24th September, 1987 by Fisheries College, Tuticorin at Amali Nagar fishing village near Tiruchendur with the cooperation of the State Fisheries Department and Tiruchendur Panchayat Union.

A ten-day training programme on forage production was organised at the Department of Forage Crops, School of Genetics, TNAU, Coimbatore to the personnel of different departments/organisations connected with livestock management.

The KVK, Madurai and the Poultry Production Training Centre, Madurai organised a training programme on poultry management from 21st to 29th September, 1987

An off-campus training on utilisation of coir pith was conducted by the Krishi Vigyan Kendra, Coimbatore on November 19, 1987 at Aliyar Fibres at Kottur Malayandipattinam village, Coimbatore district.

A training programme on fish culture in farm ponds was held at Tamil Nadu Rice Research Institute, Aduthurai on November 20, 1987.

Farmers' Day was held at TNAU, Coimbatore on 12th January, 1988.

Important Events

Dr V Rajagopalan, Vice-Chancellor laid the foundation stone for construction of the second phase of the hostel blocks at a cost of Rs 19.00 lakhs in Agricultural College, Killikulam on January 6, 1988.

Input distribution function of the Lab-to land programme was held at Krishi Vigyan Kendra, Pondicherry on May 19, 1987.

Ms C Sylendra Babu and S. Merwin Alexander of Department of Agricultural Extension and Rural Sociology, Mr. J. Albert Gabriel Arul Mani and Selvi M V Banumathi of Department of Agricultural Economics and Mr. R. Ravichandran of Department of Soil Science & Agrl. Chemistry were successful in the All India Civil Service Examination, 1986.

All India trekking camp for NCC girl cadets was organised at Kallar and Dr. V Rajagopalan, Vice-Chancellor of TNAU flagged off the trekking expedition on May 7, 1987.

Dr M. Swamiappan, Associate Professor of Agrl Entomology, Killikulam was awarded the National Memorial Gold Medal for the best Ph.D thesis in Plant Protection.

The first lecture on Bharathi Centenary Endowment was organised at Tamil Nadu Agrl University, Coimbatore on 22nd September, 1987.

The students of the college of Agrl. Engineering, TNAU, Coimbatore organised 'Drought Management Day' on October 5, 1987.

Under the massive tree planting programme, 200 neem seedlings were planted by the Dean, staff and students of the Agricultural College, Killikulam on September 30, 1987.

A laboratory constructed under the NARP at a cost of Rs 6.90 lakhs was declared open by Dr. V Rajagopalan, Vice-Chancellor, TNAU, Coimbatore on October 8, 1987 at Livestock Research Station, Kattupakkam.

A slaughter house constructed under AICRP for mutton sheep at a cost of Rs 2.60 lakhs was declared open by Dr. P. Kothandaraman, Dean, Madras Veterinary College, Madras.

Selvi Mary Praba, II B. E. (Ag), was awarded the College of Ministers' prize for the best student orator. Thiru C Devarajan, IV B. Sc. (Ag), Agrl. College & Res. Institute, Madurai and Selvi C. T. Alli of Madras Veterinary College were awarded the Pro-Chancellor's Prize for the best student atheletes.

Thiru A. Punniamurthy, III B. Sc. (Ag) of Agricultural College, Killikulam won the first prize in essay writing and second prize in debating conducted by the District Cooperative Society, Tirunelveli.

The International Volunteers' Day was observed on December 6, 1987 by about 200 under-graduate students at TNAU, Coimbatore

Dr. V Rajagopalan, Vice-Chancellor inaugurated the one day State Level review meeting of transfer of technology project (ICAR) at Coimbatore campus on January 4, 1988.

Importent Visitors

The State Agricultural Minister and Pro-Chancellor of TNAU, Coimbatore, Hon'ble Thiru K. Rajaram visited the University main campus on June 8, 1987.

Dr M. S. Swaminathan, Director General, IRRI, Philippines visited TNAU, Coimbatore on July 10, 1987.

Eighty-nine trainees representing 29 countries from International Crop Research Institute for Semi-Arid Tropics, Hyderabad, visited TNAU, Coimbatore on July 25 and August 1, 1987.

A team of West and Equatorial African Agricultural Research Directors visited TNAU on 29th and 30th September, 1987 on a study tour

The U. S. Agency for International Development (USAID) team visited TNAU on October 12, 1987 as a part of its programme to assess the impact of agricultural education on agricultural development in India.

A Soviet delegation consisting of Dr. E. A. Karimov, Head of Division of Immunization, Uzbek Veterinary Research Institute, Samarkand and Dr V. T. Zamblotsky, Senior Scientist, All Union Research Institute of Experimental Veterinary, Moscow accompanied by Miss Kalpana Purang an interpreter and Dr. Matueychuk of USSR Embassy, New Delhi visited the Madras Veterinary College, Madras on November 16, 1987.

Dr. Keijiro Otsuka, Agricultural Economist, IRRI, Manila, Dr Mahabub Hussain, Bangladesh Institute of Development studies, Dhaka and Dr Alakh Chatopadyay, Kalayan University, West Bengal visited the CARDS on January 22, 1988.

FOREIGN VISITS

Foreign visits by the faculty members of Tamil Nadu Agricultural University during 1987-88

Name and Designation	Country visited	Period	Purpose
Dr SP. Palaniappan Professor and Head Dept. of Agronomy Coimbatore	IRRI, Manila	25.5.87 to 29.5.87	Symposium on Sustainable Agriculture

Foreign Visits

Name and Designation	Country visited	Period	Purpose
Dr M. N. Prasad Professor and Head CRS, Srivilliputhur	IRRI, Manila	Two Years from April '87	Visiting Scientist
Dr. S. Palaniswamy Professor of Rice School of Genetics Coimbatore	IRRI, Manila	Two months February & March, 88	Simulation and system Analysis for Rice Production
Dr. T. M. Thiagarajan Assoc. Professor KFSC, Trichy	IRRI, Manila	-do-	-do-
Thiru N. Raju Assistant Professor RRS, Tirur	IRRI, Manila	-do-	-do-
Thiru M. N. Budhar Asst. Professor of Agronomy Coimbatore	IRRI, Manila	-do-	-do-
Dr. G. S Thangamuthu Professor of Agronomy Coimbatore	China	2.6.87 to 25.6 87	International *Azolla* Training Course.
Dr. C. Ramaswamy Assoc. Professor (Agri. Economics)	Washington U.S.A.	20.4.87 to 12.6.87	International Food Policy Research Instt., Collaborative Research Project
Coimbatore		18.11.87 to 26.11 87	Workshop on Second Differential Impact Study.
Dr. S. R. Sree Rangasamy Director, School of Genetics,	Bangkok Thailand	16 11.87 to 21 11.87	Second International symposium on Mungbean.
Coimbatore	IRRI Manila	14.3.88 to 18.3.88	International Workshop on Bacterial Blightal of Rice.
Dr. S. Kannaiyan Professor of Bio-Technology Coimbatore	U.S A	18.11.87 to 18.1.88	Study on Sporulation Mechanism in *Azolla*.

Dr. V. Subramaniyan Dean College of Agricultural Engineering, Coimbatore	Malaysia	15.11.87 to 19.11.87	Sixth International Conference and Seminar on Tamil
Thiru G. Alagarswamy Asst. Professor of Plant Pathology, Coimbatore	Manila	20.7.87 18.11 87	Training on Integrated Pest Management.
Thiru. Gomathynayagam Asst. Professor of Botany ARS, Paramakudi	IRRI Manila	20 7.87 to 6.11.87	Short Training Course on Upland Rice.
Dr. S. Jayaraj Director, CPPS, Coimbatore	Bangkok Thailand	16.11.87 to 20.11.87	International Symposium on Mungbean.
Thiru P. Balasubramaniam Assistant Professor of Agronomy, Coimbatore	Bangkok Thailand	26 10.87 to 18 12.87	Training on Rice Cultivation
Dr. S. Varadarajan Prof. of Agrl. Economics Coimbatore	Czeckoslovakia	Three months from Aug. 87	To Study Advances in Economics and Change Ideas on Indian Economic Thought and Experience.
Tmt. A. Susila Thirumaran Associate Professor of Food Science, Coimbatore	Bangkok	15.11.87 20.11.87	International Symposium on Mungbean.
Dr. V. Sreenarayanan Asso. Prof & Head Agrl. Processing CAE, Coimbatore	Los Banas Philippines	7.11.87 to 16.11.87	Workshop on Design of Drying and Malling Equipments.
Thiru R. Narayanan Asst. Prof. of Microbiology Coimbatore	Indonesia	1.8.87 to 9.8.87	Symposium on Contribution of Biological fixation to Plant Protection.
Dr K. Subbiah Associate Professor of Horticulture Madurai	U. S. A.	27 7.87 to 26.7 88	Forestry Training.
Dr. V. Stephen Vinaraj Assoc. Professor FRS, Mettupalayam	U.S.A.	27.7.87 to 26.7.88	Forestry Training.
Thiru V. N. Srinivasan Assoc. Professor FRS, Mettupalayam	U.S.A.	14.8.87 to 13.8 88	Forestry Training.

FINANCE AND ACCOUNTS

The following statement indicates the classsified summary of the transactions of the University during 1987-88

DETAILS			AMOUNT (Rupees in lakhs (Unreconciled and unaudited figures)
Opening balance as on 1.4.87			104.87
Receipts			
State Grant :			
Agriculture			
Non-Plan	546.17		
Plan	298.56		
Western Ghat Development Scheme (Horticulture)	1.00		
Veterinary			
Non-Plan	173.25		
Plan	184.52		
Fisheries			
Plan	35.71		1239.21
ICAR Grant :			
ICAR (Fully Financed)	54.36		
ICAR (Partly Financed)	112.93		
Development Grant	76.70		
NARP	7.15		
ICAR Fully Financed (Veterinary)	3.93		
ICAR Partly Financed (Veterinary)	15.65		
Seminars	1.15		
			271.87
G. O. I. Grant :			
For Agrl. Research Schemes			35.46
Outside Agencies .			
Foreign & Indian Agencies Res. Schemes			30.96
Other Receipts :			
(Fee rent, farm receipts etc.)			
Agriculture		167.20	

Veterinary		34.00
Fisheries		0 69
State Govt. Loan for House Building		15.00
Loans and Advances		133.94
	Total	350.83

Expenditure **(Rupees in lakhs)**

1.	Agriculture-Non-Plan	703.80
2.	Agriculture Plan	301.36
3.	Veterinary-Non-Plan	192.33
4.	Veterinary-Plan	187.91
5.	Fisheries - Plan	39.44
6.	ICAR Fully Financed Schemes	
	Agriculture	15.98
	Veterinary	10.32
7.	ICAR PARTLY FINANCED SCHEMES	
	Agriculture	140.21
	Veterinary	16.99
8.	Govt. of India Schemes	53.27
9.	Other Agencies	21.17
10.	ICAR Development Grant	21.75
11.	National Agrl. Res. Project	40.55
12.	Hill Area Development Programme	1.14
13.	House Building Advance	15.00
14.	Krishi Vigyan Kendra, Pondicherry	8.85
15.	Deposit Transactions Including Loans and Advances	142.24
	Closing balance	120.89
		2033.20

The Finance Committee at its 31st meeting considered and recommended the budget estimate of 1987-88 of Tamil Nadu Agricultural University and recommended the estimate to the Board of Management. The annual audited accounts for the year 1986-87 have since been finalised. As the accounts for 1987-88 are yet to be certified by audit, the expenditure details furnished represent only unaudited and unreconciled figures.

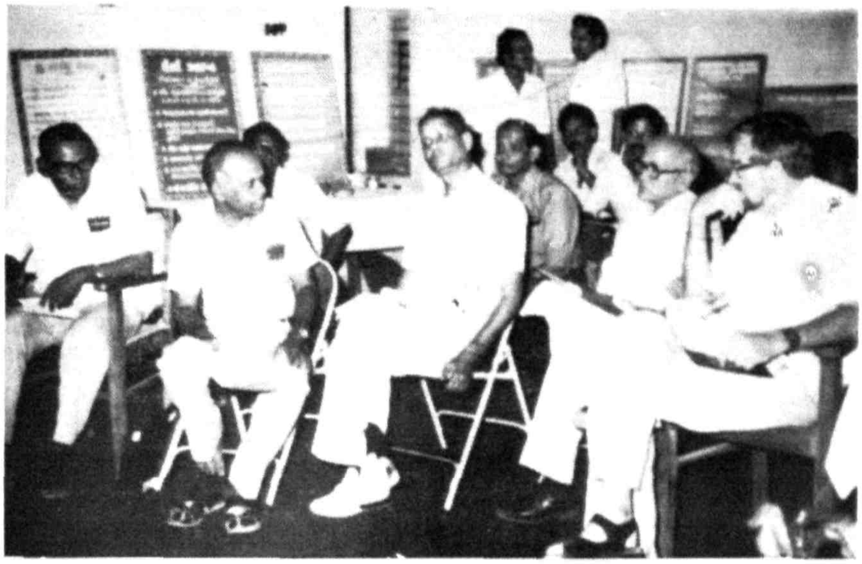
University Budget Estimate for 1987-88

Annual financial estimate of Tamil Nadu Agrl. University had been approved by the Financial Committee/Board of Management for a gross appropriation of Rs. 1803.91 lakhs (including amounts from the ICAR, Govt. of India and other agencies, loans and advances and deposit transactions)

In the budget estimate for 1988-89 a sum of Rs 1321.47 lakhs was fixed as net grant by the State Government for implementing various education, research and extension activities. The grants from ICAR would be about Rs. 403.20 lakhs including the implementation of ICAR development grant and NARP schemes. The grants expected from Govt. of India and other agencies were Rs. 35.59 and 17.05 lakhs respectively. Further, University receipts anticipated were Rs. 241.37 lakhs approximately.

National Workshop on Heliothis Management

Indo-US Study Team at Fisheries College, Tuticorin



World Bank Team at Rice Research Station, Ambasamudram

Regional Research Council Meeting in Progress - HRS, Thadiyankudisai

Inauguration of Training Programme on Integrated Pest Management in Rice

Vice-Chancellor Addressing the Pesticide Analysts Meet

3. EDUCATION

AGRICULTURAL COLLEGE AND RESEARCH INSTITUTE, COIMBATORE

Dr. V. D. Guruswamy Raja was Dean incharge from 1.4.87 to 6.8.87 and Dr. T. K. Kandaswamy joined as Dean on 7.8.87 and continued till the end of the year. The Agrl. College and Research Institute,Coimbatore continued to offer B.Sc. (Agri) and B Sc. (Forestry) degree programmes under the trimester system.

Admission

The number of students on roll (boys and girls) in different years of the degree programmes as well as the date of commencement of the first trimster of the academic year 1987-88 for above students are furnished below:

Degree programme	Year	Boys	Girls	Total	Date of commcement of first trimester
B.Sc. (Ag)	I	68	66	134	2.11.87
	II	83	77	160	18 8.87
	III	112	82	194	31.8 87
	vI	68	113	181	31.8.87
B.Sc. (Forestry)	I	19	—	19	2.11 87
	II	16	4	20	18.8.87
	III	17	3	20	31.8.87
Total		383	345	728	

Educational Tour

A study tour was organised for the III year B.Sc. (Ag) students during the year 1987-88 under the course AGR. 305 (0+1). All the 183 students registered the course and were taken to the following institutions located in the Southern Zone from 14.12.87 to 20 12.87.

1. Tobacco Research Station, vedasanthur.
2. Agrl. College and Res. Institute, Madurai.
3. Regional Research Station, Aruppukottai
4. Agricultural Research Station, Kovilpatti

5. Fisheries College, Tuticorin

6. Model Orchard Courtallam

7. Rice Research Station, Ambasamudram

8. Cotton Research Station, Srivilliputhur

9. Horticultural Research Station, Periyakulam

An all India study tour was organised for the final B.Sc. Ag) and B.Sc. (Hort) students numbering 222 during the months of January and February 1988 for a period of 15 days.

The students visited various institutions at Madras, New Delhi, Karnal and Hyderabad The Madras Veterinary College, Indian Agrl. Research Institute National Dairy Research Institute, Indian Institute of Mass Commuication and International Crop Research Institute for Semi-arid Tropics were some of the national and International Institutes visited by the students.

Earn While You Learn Scheme

By an innovative scheme (Earn while you learn) the students were offered an opportunity to gain practical experience in cultivating crops like cotton, ragi and rice besides getting some monetary return. A total number of 184 students participated in the scheme. A total amount of Rs. 26,932/- was disbursed to the students as net income obtained from their plots. The average income per student was Rs. 146/-.

Village Stay Programme

The final B.Sc. (Ag). and B.Sc. (Hort). students numbering 222 were placed in villages from 14.9.87 to 13.10.87 in Coimbatore, Periyar, Salem, Dharmapuri, Trichi and the Nilgiris districts with a view to gain rural orientation and village experience. Altogethr 35 locations were identified with 6-8 villages for each location. One student was assigned to each village. One staff member was incharge of one to two locations to guide the students. The students conducted field study with the help of a structured interview schedule and identified themselves with the farmers. Officials and contact farmers under T&V system helped in the field study and also to conduct method demonstrations and exhibitions in the villages. The students conducted method demonstrations like mushroom cultivation, selection of good paddy seeds, control of red palm weevil in coconut, treating banana suckers with furadan granules for contral of nematode, rat control, post harvest technology etc., in the villages. Newspapers and All India Radio gave wide coverage on the Village Stay Programme. News stories on various method demonstrations conducted by the students in the villages appeared in News Dailies along with action photographs. Several village meetings were organised by the students during their stay. They attended the fortnightly meetings conducted by the extension personnel of Training and Visit System and studied the activities and functioning of the T&V system.

Scholarship

Sl. No.	Name of the Scholarship	No. of recipients	Total amount received (Rs.)
1.	National Merit Scholarship	32	55,250.00
2.	National Loan Scholarship	1	970.00
3.	State Scholarship for Teachers' Children	1	480.00
4.	S. C. Scholarship	80	1,72,846.50
5.	Adhoc Merit Grant for SC/ST	22	6,600.00
6.	Bright Student Award	4	2,880.00
7.	S. C. Loan Scholarship	69	1,26,700.00
8.	B C. Scholarship	93	75,807.50
9	ICAR - HRDP - U. G.	6	28,800.00
10.	Pondicherry State Scholarship	17	26,882.50
11.	Govt. of Andhra Pradesh	2	1,776.00
12.	General Cultural Scholarship Scheme	2	1,786.00
13.	Commonwealth Scholarship Scheme	1	8,820.00
14.	IDRC Fellowship	2	21,035.00
15.	M/s. E. L. D. Parry Ltd., Madras	1	2,400.00
16.	M/s. Potash Research Institute of India	1	6,000.00
17.	M/s. Godrej Limited	1	9,600.00
18.	ICAR Junior and Senior Fellowship	89	9,05,435.00
19.	Indo Ethiopian Cultural Exchange Programme	1	8,278.00
20.	*Project and Development India*	1	26,600.00
21.	FACT	1	34,000.00
22.	Aspee Foundation Bombay	5	83,214.00
23.	ICAR Merit cum Means	9	18,360.00
24.	Pyrites, Phosphates and Chemical & Ltd.,	1	6,800.00
25	WAFM Farmers Welfare Trust Society	1	8,450.00
26.	Coramandal Indag Products (P) Ltd.,	1	12,500.00
27.	Indian Cardamom Research Institute	1	25,000.00
28.	HRD-Indian Council of Cultural Relations	1	17,098.00
29.	Gandhi Memorial Award	1	2,500.00
30.	GOI-Ministry of Human Resources Development-General Cultural Scholarship Scheme	2	1,786.00
31.	Dr. Ambedkar Award	1	1,000.00
32.	TNAU Merit Scholarship (UG and PG)	85	83,990.90
	Total	535	17,83,645.40

Students Hospital

Dr. G. Perumal, Professor and Head, Dept. of Agrl. Extension and Rural Sociology was the Warden and the following were the Deputy Wardens in charge of the different assignments to run the hostel till 21.11.87

1. Dr. PL. Lakshmanan, Assoc. Professor of Nemotology, Deputy Warden (Accounts).

2. Thiru U. Bangarusamy, Asst Professor of Crop Physiology, Deputy Warden (Messes).

3. Dr. K. Rajakannu, Assoc. Professor in Soil Science and Agrl Chemstry, Deputy Warden (Stores).

4. Dr K. P. Palanisamy, Assoc. Professor, Faculty of Horticulture Deputy Warden (Students' Canteen)

5. Dr. G. Selvakumari, Assoc Professor of Soil Science and Agrl. Chemistry, Deputy Warden (Ladies Hostel)

6 Tmt. S. Krishnaveni, Asst Professor, Dept. of Microbiology, Deputy Warden (Ladies Hostal)

An Adhoc Committee with following members was appointed by the Registrar to look after the duties of the Warden and Deput Wardens with effect from 22.11.87.

1. Dr. M. Stephen Dorairaj, Professor of Genetics, Convener, (Head of the Committee) and overall incharge of all portfolios of the hostels.

2. Dr. M Gopalan. Professor and Head, Dept. of Agrl. Entomology, Member, Accounts.

3. Dr. K. K. Mathan, Associate Professor, Dept. of Soil Science and Agrl. Chemistry, Member, Accounts.

4. Dr. K. Sivaprakasam, Professor of Pl. Pathology, Member, Students' Canteen.

5. Dr S. Palanisamy, Professor of Rice, Member, Messes.

6. Dr. M Kulasekaran, Professsor of Pomology, Member, Messes.

7. Dr. V. S. Shanmugasundaram, Professor of Agronomy Member, Stores.

8 Dr. S Krishnamoorth, Assoc. Professor of Agrl. Economics, Member, Stores.

9. Dr Sukanya Subramanian Professor and Head, Dept. of Forage Crops Member, Ladies Hostel.

10. Tmt. R. Kasthuri, Asst Professor, Dept. of Biochemistry, Member, Ladies Hostel.

11 Selvi T. Alagumani, Asst. Professor, Dept. of Agrl. Economics. Member, Ladies Hostel

Thiru G V Krishamoorthi continued as Assistant Accounts Officer, during the year.

Studente' Club

The students participated in a number of literary events and competitions and revealed their talents in arts, photography, oratorial elegance, light music etc. Inter-collegiate arts and photographic competition held in June, 87 attracted as many as 75 entries. Dr. V. D. Guruswamy Roja inaugurated the exhibition and distributed the prizes.

Social Service League Annual Day and Sports Day were celebrated on 5th July, 1987 with Dr. V. D. Guruswamy Raja, Dean (PGS) was the Chief Guest. Independence Day was celebrated in a colourful manner and Dr. T. K. Kandaswamy, Dean (Agri) hoisted the National flag. He was given a warm guard of honour by the NCC cadets The students took part in elocution contests and essay competitions at Chinmaya Vidyalaya and those organised by Coimbatore District Lions Club and won prizes.

The students participated in the South Zone inter-university youth festival held at Madurai-Kamaraj University during January, 1988 The National Unity Week was observed from 19th to 25th November, 1987

Republic Day was celebrated in a grand manner. Dr. V. Rajagopalan, Vice Chancellor unfurled the National flag and delivered the Republic Day Message. He distributed certificates of merit to the N. C. C. cadets.

In the State level cultural festival organiaed by the P. S. G. College of Technology the college orchestra team won the second place while one student of II B. E. (Ag.) received the best intrumentalist award In the Coimbatore district inter-collegiate cultural competitions organised by the Govt. Arts College, Coimbatore one student of I M. Sc. (Ag) class won the first prize for Baratha Natyam.

Sports and Games

The college team participated in foot ball, hockey, volley ball, cricket and badminton matches at State and other levels.

The University participated in South Zone inter-university foot ball tournament held at Kottayam and won first two rounds. The main campus hockey team participated in the Coimbatore district league hockey tourney at Coimbatore and won one match It occupied the fourth place The cricket team played seven matches against various clubs in the Coimbatore E division league tournament. It won two matches, drew three and lost two. It also participated in the South Zone inter-university cricket tournament held at Madras University.

The women table tennis team took part in the inter-collegiate State level matches conducted by the PSG College of Arts and Science.

Thiru A. Raviraj. III B.E. (Ag) represented Coimbatore hockey team in the all India hockey tournament held at Hyderabad.

National Cadet Corps

The senior cadet Under Officer N. Sivakumar of III B. E. (Ag) took part in a trekking camp from 3rd December to 14th December, 1987 at Shivaji Trek, near Pune, Maharashtra State.

After the assumption of Office Commanding Lt. Col. T. C. Mathur, organised a conference of part - time NCC Officers on 10th December, 1987 at the 4 TN BN NCC. Matters connected with training and annual training camps were discussed.

Annual training camp for senior division boys was held from 9th to 20th January, 1988 at Kandar College, P. Velur. Twenty nine cadets from our

University participated. JCUO N. Siva kumar of III B. E. (Ag) was selected as cadet adjudant for the entire camp period.

The Republic Day parade was held on 26th January, 1988. Dr. V. Rajagopalan, Vice - Chancellor hoisted the national flag and took the salute presented by NCC officer and cadets of this University.

Two cadets Thiru N. Sathiamoorthy of III B E. (Ag) and Thiru A. Natarajan, of III B Sc. (Ag) underwent a preliminary R. D. parade coaching camp at Seshanchavadi in Salem district from 15th to 26th February, 1988.

The NCC Certificate 'C' examination was held on 23rd March, 1988 at Govt. Arts College, Coimbatore. Six eligible cadets from our University attended the same.

The certificate 'B' examination was held at Tamil Nadu Agrl. University grounds on 28th March, 1988. Seven cadets from this University attended the examination. 24 cadets from arts Colleges of Coimbatore also attended the examination.

National Service Scheme

The National Service Scheme continued to function during 1987-88 with 700 volunteers. NSS Units were functionining in all the campuses of the Un versity.

The volunteers activity participated in the various activities organised during the year. Specific programmes were organised for students from different faculties of agriculture, agricultural engineering and veterinary sciences. Afforestation programmes, pest incidence survey soil testing and popularising farm implements and non-conventional energy sources were the activities carried out by the students.

Apart from the specific programmes the students involved themselves in collecting used clothes and distributing them to the needy poor A batch of students from Agricultural College, Coimbatore attended to the cleaning and maintenance of smokeless country choolas in a harijan colony in sellakkarisal village

COLLEGE OF HORTICULTURE, COIMBATORE

Dr. K G. Shanmugavelu continued as Dean (Horticulture). The Faculty of Horticulture continued to offer B.Sc. (Hort), M.Sc. (Hort) and Ph.D. degree programmes under the trimester system of education. The Faculty also offered courses to B.Sc (Ag), B.Sc. (Forestry) and B.E. (Ag) degree programmes.

Admissison

The College was reopened on 18.8.87 for II year B Sc. (Hort) and on 1.6.87 for IV year B.Sc. (Hort). The first year B.Sc. (Hort) and III B.Sc. (Hort) courses commenced on 4.11.87 and 31.8.87 respectively during the year 1987-88.

The number of students on roll in I, II, III and IV year B Sc. (Hort) is as follows.

	Boys	Girls	Total
I B.Sc. (Hort)	31	30	61
II B.Sc (Hort)	30	30	60
III B.Sc. (Hort)	25	30	55
IV B.Sc. (Hort)	20	19	39
	106	109	215

Educational Tour

The final B.Sc. (Hort) students numbering 39 were on all India study tour from 30.1.88 to 15.2.88. They visited the following places of interest, which gave them an idea on different research and extension programmes in operation at various centres

1. Indian Agrl. Research Institute, New Delhi.
2. National Dairy Institute, Karnal.
3. International Crops Research Institute for the Semi Arid Tropics, Hyderabad.
4. Andhra Pradesh Agricultural University, Hyderabad.
5. Madras Veterinary College and Poultry Research Station, Madras.

They also went to UPASI Tea Scientific Department Anaimalai to undergo practical training in tea and cinchona from 28.6.87 to 4.7 87. They also studied various plantation crops like rubber, coconut, cashew, arecanut and palmyrah at places like Kanyakumari, Vepankulam, Srivilliputhur, Vridhachalam from 2.8.87 to 9.8.87

The third B.Sc. (Hort) students went on short tour to Kodaikanal, Thadiyankudisai and Periyakulam from 12.2 88 to 16.2.88.

The final B.Sc. (Hort) students were taken on a one day tour to Government Botanical Garden, Ooty on 25th May, 1987 on the eve of the Horticultural show.

Village Stay Programme

The final B.Sc. (Hort) students numbering 39 underwent village stay programme from 14.9.87 to 31.10.87 at the following villages.

Place	District	No. of students
Thondamuthur	Coimbatore	7
Ayothiapatnam	Salem	7
Thimmapuram	Dharmapuri	7
Coonoor	The Nilgiris	6
Ooty	The Nilgiris	6
Gobichettipalayam	Periyar	6
		39

Scholarship

The details of scholarships awarded during the year 1987-88 are given below:

S.No.	Name of the Scholarship	No. of recipients
1.	Adidravidar Welfare	33
2	B. C.	29
3.	Adidravidar Welfare Loan Scholarship	22
4	Gandhi Memorial Scholarship	1
5	Bright Student Award	1
6	National Merit Scholarship	1
7.	ASPEE Jr Fellowship	1
8	ICAR MCMS (Undergraduate)	2
9.	ICAR Jr Fellowship	6
10.	ICAR Sr. Fellowship	2
11.	Adhoc Merit (SC)	3
12.	TNAU Merit (U G)	12
13.	TNAU Merit (P. G.)	1
		114

COLLEGE OF AGRICULTURAL ENGINEERING, COIMBATORE

Dr. V. Subramaniyan continued to hold the post of Dean (Engg) upto 29.2.88. Prof. K R. Swamination, Head, Bio-Energy was put in full additional charge from 1.3.88 The faculty continued to offer B. E. (Ag) degree programme, M. E. (Ag) degree programme in Soil & Water Conservation, Farm Machinery and Power, Post Harvest Technology and Bio- Energy and Ph. D. programme besides offering courses in agricultural engineering for B. Sc. (Ag), B. Sc. (Forestry) and B. Sc. (Hort) students.

Admission

One hundred and three students were admitted to I B. E. (Ag) course. The first trimeser for the I B. E. (Ag) commenced on 2.11.87 and for the II, III and final B. E. (Ag) on 3.12.87, 14.12.87 and 28.12.87 respectively. The number of students on roll in I, II, III and IV year B. E. (Ag) was as follows :

Class	Boys	Girls	Total
I B. E. (Ag)	85	18	103
II B. E. (Ag)	81	21	102
III B. E. (Ag)	79	16	95
IV B. E. (Ag)	70	7	77
Total :	315	62	377

Educational Tour

The III B. E. (Ag) students were on tour from 23.7.87 to 30.7.87 and they visited the following industries and institutions in Tamil Nadu:

M/s Seshasayee Paper and Boards Ltd. Erode; NAFED Processed Foods, Vellore; Institute of Hydraulics and Hydrology, Poodi; 'J farm, Murugappa Polytechnic and Adayar Drip Irrigation Farm at Vandalore, Madras, Neyveli Lignite Corporation, Neyveli; and Tamil Nadu Asbestos (Pipes) and Kaveri Sugars and Chemicals, Trichy.

The final year students went on all India study tour from 22.7.87 to 12.8.87 and they visited the following institutions and industrial organisations in India :

a. Sterling Co, and Poultry Research Station, Madras.

b Central Plant Protection Training Institute, Andhra Pradesh Agricultural University and ICRISAT at Hyderabad.

c. Water Technology Centre, Indian Agricultural Research Institute, M/s. Eicher Good Ltd., M/s. Frick India Ltd., and Indian Instt. of Technology at New Delhi.

d. Central Soil Conservation Centre for Research and Training and Forest Research Institute at Dehra Dun.

e. Baba Atomic Research Centre, M/s. International Tractors, Marine Drive RCC protection walls against sea erosion, M/s. American Springs and Processing Works and Arey Milk Colony at Bombay.

f. M/s. V. S. T. Tillers Ltd., Visweswaraya Industrial and Technology Museum, M/s. National Seeds Corporation and University of Agricultural Sciences at Bangalore.

Practical Training

The III B.E. (Ag) students were on practical training from 1.12.87 to 24.12.87 in the following organisations.

a) M/s. TEXMO Industries, Coimbatore.
b) Office of the Executive Engineer (Agrl. Engg), Coimbatore.
c) LBP River Valley project, Coonoor
d) Command area development programme, Gobi.
e) UPASI, Valparai.
f) TANTEA, Coonoor.

Scholarships

Details of scholarships awarded during 1987-88 are detailed below :

S. No.	Details of Scholarship	No. of recipients
1.	ICAR Merit Scholarship	10
2.	Scheduled Caste Loan	66
3.	Scheduled Caste Scholarship	48
4.	Teachers' Welfare Scholarship	2
5.	Backward Class Scholarship	63
6.	TNAU Merit Scholarship	20
7.	National Merit Scholarship	14
8.	Govt. of Pondicherry Scholarship	1
9.	I.I.T. Scholarship	1
10.	Ex. Serviceman Scholarship	1
11.	U.S.A I.D. Scholarship	2
12.	C.F.T.C. Scholarship	1
1 .	Arunachal Pradesh Scholarship	2
14.	Nagaland Scholarship	2
15	Indo-Ethiopiean Exchange Cultural Programme Scholarship	1
16	Jammu & Kashmir State Loan Scholarship	1
	Total	235

Students' Hostel

Prof R. Manian, Senior Research Engineer of Zonal Research Centre was the Warden upto 30.6.87 and Dr. D. Chandrasekaran, Prof & Head, Soil and and Water Conservation took charge as Warden from 1.7.87 He was assisted by two Deputy Wardens. Student office bearers were also selected to help in the functioning of the hostel. Regular meetings of the mess representives were held to discuss the points for smooth management of the messes.

There were 344 students residing in the hostel including 54 lady students in the ladies hostel.

In the budget estimate for 1988-89 a sum of Rs. 1321.47 lakhs was fixed as net grant by the State Government for implementing various education, research and extension activities. The grants from ICAR would be about Rs. 403.20 lakhs including the implementation of ICAR development grant and NARP schemes. The grants expected from Govt. of India and other agencies were Rs. 35.59 and 17.05 lakhs respectively. Further, University receipts anticipated were Rs. 241.37 lakhs approximately.

AGRICULTURAL COLLEGE AND RESEARCH INSTITUTE, MADURAI

Dr. T. Kumaraswami continued as Dean upto 30.4.87. Dr. S. Neelakantan, Professor and Head, Dept. of Food Science and Nutrition was Dean incharge from 1.5.87 to 4.8.87. Dr T. S. Manickam joined as Dean on 5.8.87 and continued. There were 14 departments, ten under the faculty of Agriculture, and four under the faculty of Basic Sciences and Humanities. The Dean was assisted by one Administrative Officer and an Accounts Officer in office administration and a Warden and three Deputy Wardens in the hostel administration.

Admission

The number of students on roll during 1987-88 was as follows :

	Boys	Girls	Total
I B Sc. (H. Sc.)	4	13	17
II B Sc. (H. Sc.)	—	11	11
III B. Sc. (H. Sc.)	2	11	13
I B Sc (Ag.)	23	78	101
II B. Sc. (Ag.)	36	58	94
III B. Sc. (Ag.)	24	64	88
IV B. Sc. (Ag.)	83	34	117
I M Sc. (Ag.)	32	16	48
II M. Sc. (Ag.)	37	5	42
I M. Sc. (Hort.)	6	3	9
II M Sc. (Hort)	2	1	3
I M. Sc. (FSN)	—	3	3
II M. Sc. (FSN)	—	3	3
	249	300	549

Educational Tour

Ninety-five II B.Sc. (Ag.) students were taken on educational tour in two batches to research stations at Periyakulam, Kodaikanal, Srivilliputhur, Kovilpatti, Tirunelveli, Tirupathisaram, Aruppukottai and Paramakudi and also to the Fisheries College at Tuticorin from 4.1.88 to 9.1.88.

Eighty-eight III B Sc. (Ag) students were on educational tour to research stations at Vedasendur, Aliyarnagar, Mettupalayam, Ooty, Bhavanisagar, Vridhachalam, Cuddalore, Chidhambram, Aduthurai, Trichy and Pudukkottai and also to the main campus at Coimbatore from 19.1.88 to 25.1.88.

One hundred and sixteen final B.Sc. (Ag.) students were on all India tour from 5.3.88 to 20.3.88. The students visited Madras Veterinary College, Madras and various Agrl. Universities and Research Centres at Hyderabad, New Delhi and Bhubaneswar.

Fifteen Final B. Sc. (H. Sc.) students were on educational tour to Gandhigram Rural Institute, various factories, the main campus at Coimbatore and Ooty from 20.2.88 to 27.2.88.

Village Stay Programme

One hundred and fourteen final B Sc. (Ag.) students underwent village Stay Programme for one month from 1.12.88 to 30.12.88 in fourteen places in five districts.

Dr. M. S. Swaminathan, Director General, IRRI, Philippines
at the Paddy Breeding Station, Coimbatore

Scientific Workers' Conference, 1987 - Address by
Thiru N. Athimoolam, Director of Agriculture

Scholarship

Sl. No.	Details	Number of recipients UG	PG	Total
1.	Adidravidar Welfare Scholarship	44	1	45
2	Backward Classes Welfare Scholarship	60	—	60
3.	DNT Scholarship.	3	—	25
4.	Agrimerit Scholarship	46	16	6
5	ICAR Jr. Fellowship	—	37	37
6.	National Loan Scholarship	3	—	3
7.	National Merit Scholarship	25	—	25
8.	Pondicherry Scholarship	6	—	6
9.	Aspee Agrl. Research & Development Scholarship	—	1	1
10.	AMM Arunachalam Shestiabthapoorthy Scholarship	1	—	1
11.	Adidravidar Welfare Loan Scholarship	47	—	47
12.	SPIC Ltd Scholarship	—	1	1
13.	S. J. Sindal Trust Scholarship	1	—	1
14.	Cardamom Fellowship (Kerala)	—	1	1
15.	Cardamom Shootborer fellowship (collaborative programme of IEL Ltd.,)	—	2	2
16.	ICAR Post Metric Scholarship (SC/ST)	3	—	3
17.	Merit cum-Means Award Scholarship	3	—	3
18.	ICAR Scheme-Mass rearing of the parasite Platygaster	—	2	2
19.	Ford Foundation Fellowship	—	2	2
20.	Andhra Pradesh Scholarship	—	1	1
	Total :	242	64	306

Students' Hostel

There were five hostels to accommodate 560 students. During the year 1987-88 a total of 457 students (197 boys and 260 girls) availed the hostel facilities. Four messes were run in these hostels. The hostel was administered by the Chief Warden under the control of the Dean and he was assisted by a team of Deputy Wardens and resident tutors, besides administrative personnel.

The Student Welfare Committee constituted with Dean as the Chairman,

Warden as Convenor and Deputy Wardens, One Professor & Head of departments of Agril. Engineering, Accounts Officer and a student representative as members met every month and reviewed the working of the various messes, provision of amenities needed etc. and took appropriate action.

Students' Club

The Students' Club activities were inaugurated on 10 9.87 by Thiru V. Thiruvengadam, Station Director, All India Radio, Madurai. The Orientation Day address was delivered by Dr. T. S. Manickam, Dean. Five students participated in the youth festival conducted at Madurai-Kamaraj University on 26.10.87. Muthamil Vizha was celebrated for three days from April 6th to 8th 1988. Dr T. Thamilannal of Madurai-Kamaraj University inaugurated the function. A team of students and the staff associate went to Kodaikanal by cycle on 28.2.88. They covered a distance of about 200 km.

The Rotaract Club received Dr Rajappah Memorial cup from the Blood Donors Club, Madurai Medical College As a service project, refreshment stall was organised on the eve of farmers, day. Prizes were distributed to the best stall and the best farmer on that occasion. As a community programme, uniforms were distributed to two deserving children of the YWCA school.

The college cricket team participated at Madurai District Association League Tournments and it was adjudged as the best team in 'B' division. Thiru M. R. Pasupathy Rajan, I B. Sc. (H. Sc) represented the University in the Inter University Hockey Tournament held at Bangalore. Thiru H. Senthilkumar of III B. Sc. (H. Sc.) represented the University in South Zone Inter Universiy foot ball tournoment at Kottayam Thiru C. M. Ravikumar and P. Marimuthuvel of IV B.Sc. (Ag) represented the University in the inter-university South Zone Kabaddi tournament at Tiruchendur.

The inter-collegiate volley ball tournament of the TNAU was held at Madurai for the first time and the Madurai team won the runners cup. Thiru C. Dhavarajan, captain of the team received the award for the best player.

National Cadet Corps

Forty cadets belonging to different classes of B.Sc. (Ag) and B.Sc. (H.Sc.) were enrolled during the period. Thirty two NCC cadets accompanied by Dr. (Capt.) S. Subramanian went on a Cycle Expedition up to Periyakulam and trekking to Kodaikanal (Via) Kumbkarai Falls from 5th November 87. The expedition cum trekking to Kodai Hills was flagged off by Dr S. Neelakantan, Dean in-charge, Agricultural College and Research Institute, Madurai. K/Cpl. R. Arunachalam, third B.Sc. (Ag) class attended the all India Trekking Expedition at Goa from 4th October, '87 to 17th October, 87.

National Service Scheme

The National Service Scheme was actively functioning at Agricultural College and Research Institute, Madurai with 100 student volunteers. The following were the activities carried out by the members.

a) Student volunteers planted 300 numbers of neem, tamarind and *Acacia* seedlings in the campus

b) Volunteers participated in the conduct of the Sammelan organised by M. K. University from 12.9.87 to 19.9.87. They also assisted the scientists of KVK in connection with Science Exhibition held at Thamukkam ground.

AGRICULTURAL COLLEGE, KILLIKULAM

Dr. T. K. Kandaswamy continued as Dean upto July 87, and Dr. G. Soundrapandian took charge during July, 87 and continued. The College continued to offer B.Sc. (Ag) degree programme under trimester system. The number of students on roll during the year was as follows.

	Boys	Girls	Total
I B.Sc. (Ag)	101	—	101
II B.Sc. (Ag)	95	—	95
III B Sc. (Ag)	89	—	89
IV B.Sc. (Ag)	88	—	88
Total	373	—	373

Educational Tour

Eighty-three IV B.Sc. (Ag) students undertook an all India tour spread over a period of 15 days during March. 88. They visited institutions like ICRISAT, Hyderabad; Forest Research Institute, Dehra Dun; National Dairy Research Institute, Karnal etc.

Eighty-five students of III B Sc. (Ag) visited nine agricultural research stations in Tamil Nadu on a seven day tour during January, 1988. Likewise 95 students of I B.Sc. (Ag) class visited seven agricultural research stations in the State on a six day tour during November, 1987.

Village Stay Programme

Eighty-one students of the IV B. Sc, (Ag.) class stayed in selected villages in Tirunelveli, Kattabomman, Chidamparanar, Kanyakumari and Kamarajar districts for a period of one month from 4-11-87 to acquaint themselves with the activities and problems in agriculture. They were also in touch with functionaries of the extension department and T & V contact farmers. They attended daily farm routines, organised method demonstrations and participated in the fortnightly meetings of T & V programme along with Agricultural Officers.

Scholarships

Details of scholarships awarded during 1987-88 are given below.

S. No.	Name of Scholarship	Number of recipients
1.	Backward Class Scholarship	114
2.	GOI Scholarship	59
3.	S. C. Loan Scholarship	34
4.	Bright Student Award	1
5.	Pondicherry Post Metric Scholarship	14
6.	National Scholarship	9
7.	Teacher's Welfare Scholarship	1
8.	National Loan Scholarship	1
9.	Ex-servicemen Scholarship	2
10.	Gandhi Memorial Award	1
		236

Students' Club

A Tamil magazine 'Mullai' was brought out by the students. National Integration Week was celebrated from 19.11.87. Speech on secularism, anti-communalism and non-violence were given during that occasions Cultural Unity Day any Women's Day were celebrated in which students and staff participated. There was a programme for search for talent in which competitions were held in debate, music, oratory, etc.

Six students were deputed to Tamil Nadu Agricultural University for selection to participate in South Zone National Youth Festival. In the competitions held at Madurai, one student from Madras Veterinary College representing the Tamil Nadu Agricultural University won a prize

Inter-class competitions in Tamil and English literary aspects and fine arts were conducted by the students.

The students participated in various inter-collegiate competitions like quiz in science, literature and sports, oratory debate, music, drama, etc conducted by the private organisations and various city colleges in Madras.

Students of this College won serveral prizes, medals and trophies. Notable among the prizes won were the first prize in quiz conducted by Dr. Narotham Puri and II prize in drama competition held by Madras School of Cultural Academy.

Sports and Games

Dr. N. Raghavan, M.V.Sc., held the post of Sports Secretary for the year 1987-88. The college teams in different games participated in the inter-collegiate tournaments conducted by Anna University, Gurunanak College, Y.M.C.A College of Physical Education, Tamil Nadu Blue Star Association and Tamil Nadu Agricultural University during the year.

Men and women students participated in the Tamil Nadu Agricultural University pentathlon championship held at Coimbatore. Selvi B.T. Alli, of IV B.V.Sc., won the Women Pentathlon Championship.

The volley ball team bagged the Winners trophy in the inter - collegiate volley ball tournament conducted by Tamil Nadu Agricultural University at Madurai Agricultural College The college volley ball team also claimed the runners trophy in the Anna University tournament.

The college playars in foot ball, Kabaddi, hockey and basket ball were given opportunity to participate in the Tamil Nadu Agricultural University tournaments. Thiru. D. Sundararaj, Physical Director was nominated the Manager for Tamil Nadu Agricultural University cricket and basket ball teams in connection with the participation in the inter-university tournaments held at Madras and Hyderabad respectively.

National Service Scheme

The National Service Scheme unit of Madras Veterinary College carried out social service activities in Hasthinapuram village continuously and vaccinated the fowls of the farmers against contagious diseases The details of vaccinations given are as follows :

Vaccine	No. of Fowls
R D V F Vaccine	19206
PPV Vaccine	19125
RBVK Vaccine	348
	38679

VETERINARY COLLEGE AND RESEARCH INSTITUTE, NAMAKKAL

Dr. R Ramamurthi continued as Dean of the College. The College offered B V Sc., degree programme under the trimester system of education. Since the College was established only in 1985 only the first, second and third year students were studying during the period under report.

Admission

During the year, 80 students were admitted in the I B.V.Sc., class. Together with the 78 II B.V.Sc., and 74 III B. V. Sc., students the total strength of the students was 232.

Educational Tour

The students of II B. V Sc., visited Vandalur Zoological Gardens, Madras; Livestock Research Station, Kattupakkam; Poultry Research Station, Nandanam; and Madras Veterinary College, Madras on a study tour arranged on October 7-8, 1987.

Scholarships

The details of scholarships awarded are given below :

S. No.	Name of the Scholarship	No. of recipients
1.	B.C Scholarship	36
2.	SC/ST Scholarship	21
3.	National Loan Scholarship	5
4	Adhoc Merit Grant of SC/ST Students	19
5.	Pondicherry State Post-Metric Scholarship	1 1
6.	Scholarship for the Children of School Teachers	1
	Total	84

Students' Hostel

Accommodation was provided to the students at two hostels, one at Nallipalayam, 3 km away from the campus and the other at Namakkal itself.

Students' Club

Students participated in the essay competition, music competition, mono-acting and mimicry competitions organized by the Kavijnar Ramalingam Tamil Peravai on 31.7 1987.

Two students participated in the 'Oratory Competition' conducted for the Chief Minister's Prize at Tamil Nadu Agricultural University on September 14, 1987.

Two students participated in the Essay Competition organised by the Forest Department, Salem on september 26, 1987.

All the students of Veterinary College and Research Institute, Namakkal took National Integration pledge on November 19, 1987.

Students undertook tree planting at the Namakkal campus on September 25, 1987.

The students participated in the inter-collegiate cultural competition held under the auspices of World University Science Centre, Madras at the Namakkal Kavijnar Ramalingam Government Arts College (Women), conducted from 21.12.87 to 23.12.87. Thiru S. Palanisamy, II B.V Sc. won first prize in the oratorial contest (Tamil). Thiru V. Vivekanandan, II B.V.Sc and Thiru R Prakashkirbakaran I B.V Sc won first and second prizes respectively in Tamil poetry (traditional style) competition. Thiru K. Krishnakumar I B V.Sc. was awarded the consolation prize for Tamil poetry (modern style).

In the essay competition held during the youth festival conducted by Salem Sowdeswari College, Salem from February 9-15, 1988. Thiru V Vivekanandan II B.V.Sc. was awarded the third prize for Tamil essay and Thiru S. George Paradis got III prize for English essay.

Sports and Games

Thiru K. Munisamy of II B.V.Sc., competed for 'Pro Chancellor's 'Prize' for best student athlete' conducted at Tamil Nadu Agricultural University, Coimbatore on 14-9-1987.

During Septemper, 1987 inter-class matches in foot-ball, kabaddi and badminton were conducted in connection with Annual Sports.

One Student of this college was selected to represent Tamil Nadu Agrl. University in the South Zone Inter-University cricket tournament while two others were selected to represent Tamil Nadu Agricultural University hockey team.

FISHERIES COLLEGE, TUTICORIN

Dr. G Jegatheesan continued as Dean i/c. in 1987-88. The College offered B.F.Sc and M.F.Sc. courses under the trimester system of education.

Admission

Eighteen and five students were enrolled in the I B.F.Sc. and I M.F.Sc. respectively in 1987-88 The I B.F.Sc. classes started from 6.11.87 and I M F.Sc. classes from 2.3 1987 onwards. The students' strength in different classes of study is given below:

Class	Number of students
I B.F.Sc.	18
II B.F.Sc.	20
III B.F.Sc.	13
IV B.F.Sc.	17
I M.F.Sc.	5
II M.F.Sc.	-
Total	73

Educational tour

The IV B.F.Sc students went on all India educational tour from 21.2.88 to 21.3.88 and visited places of fisheries interest such as Cochin, Mangalore, Goa, Bombay, Delhi, Jammu, Calcutta and Madras.

The III B.F.Sc. students went on Tamil Nadu educational tour from 6.3.88 to 14.3 88 and visited places of fisheries interest such as Parangipettai, Chingleput, Madras, Mettur, Ooty and Coimbatore.

Scholarships

The details of scholarships awarded are given below:

Name of scholarship	No. of students
Backward Class Scholarship	13
Scheduled Caste Scholarship	15
Scheduled Caste Loan Scholarship	4
ICAR Merit Scholarship	2
ICAR Junior Research Fellowship	2
TNAU Merit Scholarship	1
National Teachers' Scholarship	1
Scholarship for Physically Handicapped	1
Total	39

Students' Hostel

Dr. G. Jegatheesan, Dean i/c., served as Warden. Thiru T K Sundaram, Asst. Professor was Deputy Warden for the students' hostels. There were one U. G. hostel and one P. G hostel for men and one U. G. hostel for women students The students strength of these three hostels was 44, 17 and 5 respectively. There was a combined mess for the men's hostels and one exclusive mess for women students. For the students recreation, one colour television, one black and white television, one tape recorder and and one radio were available in these hostels.

Students' Club

The activities of the students' club for the year 1987-88 were inaugurated on 4.12.1987 by Thiru Anoop Jaiswal, Superintendent of Police, Chidambaranar District.

The students participated in the quiz competition conducted by Holy Cross College and won second place. They also participated in the 'Quiz Time 88' of TV Programme on 6.12.87. Thiru S. Chandrasekar of IV B.F.Sc. won the outstanding speaker award in the Jaycees Regional Conference held at Tuticorin on 29.5.87. Thiru Esakkiappan of III BFSc won the second place. The Youth Club of Pearl City Jaycees was installed in the Fisheries College on 24.2.88. The students organised an inter-collegiate quiz competition entitled 'FIZZOREE' on 19.2.88.

Sports and Games

The Annual College Day, Sports Day and Club Day celebrations were held on 9.10.87 in which Kavignar Dr. E. Muthuramalingam, Chairman, Tamil Nadu Fisheries Development Corporation was the Chief Guest. The Chief Guest also distributed prizes and certificates for the winners in the various competitions.

POST-GRADUATE EDUCATION

Dr. V. D. Guruswamy Raja continued as Dean (PGS) till 31st January,

1988. Dr T K Kandaswamy was Dean incharge from 10.2.88 to 28.2.88. Dr. G V. Kothandaraman assumed charge as Dean (PGS) on 29th February, 1988 afternoon. Master's programme was offered in 23 disciplines and Ph. D. in 13 disciplines in Agriculture, Horticulture, Engineering and Fisheries faculties. In Animal Sciences, master's programme was offered in 17 disciplines and Ph. D. in 14 *disciplines*. A *Post-graduate* diploma programme was offered in Sericulture. New Ph. D. courses were introduced in Econometrics, Agricultural Engineering and Livestock Production and Management in 1987-88. The new courses proposed in master's programme for the ensuing academic year are : Agrl. - Biotechnology, Master of Business Management, Animal Husbandry Economics and Veterinary Extension Education.

Admission

The number of students admitted and passed out from various P. G programmes of the University in 1987-88 are furnished below :

Sl. No.	Post-graduate programme	No. of students admitted Boys	Girls	No. of students passed out
(1)	(2)	(3)		(4)
I.	**Master's Programme**			
	Coimbatore Campus			
A.	**M. Sc. (Agriculture)**			
1.	Agronomy	8	–	12
2.	Plant Breeding and Genetics	9	2	12
3.	Agricultural Entomology	5	4	10
4.	Plant Pathology	2	–	4
5.	Soil Science & Agrl. Chemistry	4	–	8
4.	Agrl. Extension	4	2	18
7.	Seed Technology	1	2	9
8.	Agrl. Microbiology	3	1	8
9.	Agrl. Economics	6	1	11
10.	Crop Physiology	4	1	2
11.	Agrl. Marketing Management	3	–	10
12.	Sugarcane Production	–	–	10
13.	Plant Protection	–	–	16
14.	Farming System Management	–	–	1
B.	**M. Sc. (Horticulture)**	2	6	13
C.	**M. Sc. (Agrl. Engineering)**			
	Soil & Water Conservation	–	–	4
	Total	51	19	148

(1)	(2)	(3)		(4)
Madurai Campus				
M. Sc. (Agriculture)				
1.	Agronomy	4	3	8
2.	Plant Breeding & Genetics	9	3	6
3.	Agrl. Entomology	5	3	7
4.	Plant Pathology	1	1	1
5.	Soil Science & Agrl Chemistry	2	2	22
6.	Agricultural Extension	3	4	7
7.	Seed Technology	1	1	–
8.	Agrl. Microbiology	2	1	–
9.	Agrl. Economics	–	–	8
B.	**M. Sc. (Horticulture)**	3	3	4
C.	**M. Sc. (Food Science & Nutrition)**	–	4	4
	Total	30	25	67
Tuticorin Campus				
	M. F. Sc.	–	–	1
Madras Campus				
	M. V. Sc.			
1.	Poultry Science	–	–	3
2.	Veterinary Microbiology	6	1	5
3.	Obstetrics & Gynaecology	3	–	6
4.	Therapeutics	–	–	2
5.	Veterinary Pathology	4	–	–
6.	Meat Hygiene & Technology	–	–	9
7.	Anatomy	2	1	–
8.	Surgery	2	–	11
9.	Livestock Production and Management	–	–	4
10.	Dairy Science	–	–	1
11.	Veterinary Public Health	–	–	2
	Total	17	2	43
	Grand total	98	46	259

(Master's programme)

(1)	(2)	(3)		(4)
II.	**Ph. D. Programme***			
	Coimbatore Campus			
1.	Agronomy	–	–	7
2.	Plant Breeding & Genetics	–	–	3
3.	Agrl. Entomology	–	–	2
4.	Soil Science	–	–	3
5	Agrl. Economics	–	–	1
6	Agrl Extension	–	–	2
7	Agrl. Microbiology	–	–	3
8.	Crop Physiology	–	–	1
9.	Horticulture	–	–	3
	Total			25
II.	**Madras campus**			
	Faculty of Veterinary and Animal Sciences			
1.	Poultry Science	–	–	4
2.	Veterinary Microbiology	–	–	1
3.	Obstetrics & Gynaecology	–	–	1
4.	Pharmacology	–	–	2
5.	Therapeutics	–	–	2
6.	Preventive Medicine	–	–	3
7.	Animal Genetics & Breeding	–	–	4
8	Animal Nutrition	–	–	2
9	Parasitology	–	–	1
	Total			20
	Grand total (Ph. D. Programme)			45

* Admission to Ph. D. courses for 1987 - 88 were not completed till March, 1988.

UNIVERSITY LIBRARY

The Tamil Nadu Agricultural University library holds an outstanding collection of books, research reports and Scientific periodicals and serves as a reservoir of knowledge to all students, research scholars and scientists. The quality of the collection and management have been appreciated by many dignitories.

The University library holds useful collection of Scientific documents in the fields of Agriculture, Horticulture Forestry, Fisheries, Agricultural Engineering and other allied subjects housed in a modern building with latest facilities. The library is open to all students and the faculties of the University from 9.00 a.m. - 9.00 p m from Monday to Friday and 8.00 a.m. to 2.00 p.m. on Saturdays and Sundays excluding public holidays. Along with research collections of printed materials, the library possesses substancial microform holdings, reprints, pamphlets, leaflets, reports and maps. In addition to reference services, the library conducts instruction classes on library resources, bibliographic utilization and documentation services to its clients.

The staff of the library render required assistance to the students to acquire reading materials under long and short range reference services. Through the library publication, "READ", the students and scientists are kept in touch with the latest collection of the library. Another publication, "List of Theses", was also published which lists all the theses and the project reports of B.E. (Ag). An information folder with full details about the library to understand the library system is also available. The inter-library loan based on reciprocal basis facilitates exchange of documents from other universities, colleges and academic and research institutions all over the country and abroad.

During the academic year 1987-88, the library added 1,614 books and periodical back files in its stacks. It received 151 books as gratis. The library had 1,31,507 books and back files of periodicals. The library received 1,036 periodicals of which 563 were foreign journals. Thirty one journals were received on exchange basis for Madras Agricultural Journal and 128 journals were received as gratis. The number of journals subscribed was 878.

The library received 10,360 single issues of periodicals and they were displayed in the periodical display racks. Back volumes of periodicals numbering 600 were bound and added to the stack of the library in 1987-88. The library purchased 191 books and bound nearly 500 books.

During this year 528 documents were classified, catalogued and arranged in the library. To facilitate easy location and quick charging and discharging work, all the books were provided with Shelf Register Cards, Subject Cards, Author Cards, Book Cards and Tracing Cards. From newspapers 1,311 paper clippings on various subjects on agriculture and allied fields were taken out and added into the clippings file.

The library was visited by 79,906 readers who consulted 7,56,510 documents. In the charging counter 57,898

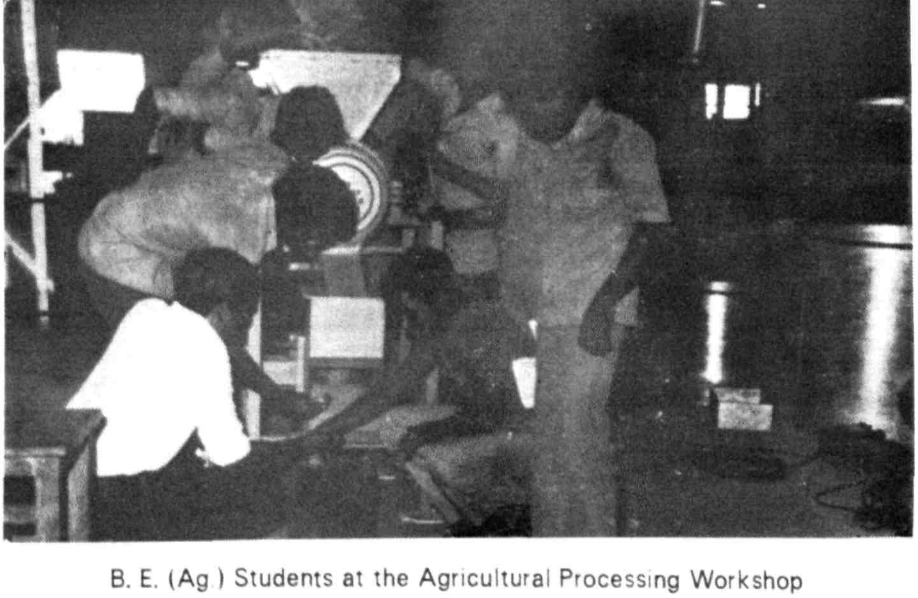
books were issued for home reading. In addition, 7,248 readers were provided with reference services in long and short range programmes.

Forty-four instruction classes were conducted for the under-graduate and Post-graduate students and research scholars. The Library Committee met four times and discussed about the future growth, development and improvements to the library.

Vice-Chancellor, Staff and Students
Transplanting Rice

Rice Cultivation by Students

Students Operating Paddy Thresher



B. E. (Ag.) Students at the Agricultural Processing Workshop

B F. Sc. Students at the Laboratory

Thiru R. Jayaraman, Chairman of Tuticorin Port Trust
Distributing Prizes to the Students

Rice - ADT 39

4. RESEARCH

The major research achievements of the University in the areas of crop improvement, management and protection, seed technology, horticulture, agricultural engineering water technology, agricultural and rural development studies, veterinary and animal sciences and fisheries are presented below :

AGRICULTURE

RICE

Crop Improvement

Variety Released

ADT 39 : This is a dwarf variety with a duration of 120-125 days. The mean grain yield is 5.6 t/ha. The grain is medium slender with white rice and good cooking quality. It is resistant to blast, BLB, grain discolouration and moderately resistant to GLH. This is highly suited for cultivation during late *thaladi* season in Cauvery delta.

Promising Cultures

A high yielding cold tolerant rice culture IRTP 10509 (IR 15324 - 12 - 2 - 3 - 3 - 2) maturing in 135 - 140 days has been identified at Paiyur for late *samba* season. This culture recorded a mean yield of 6929 kg/ha registering 9.7 and 15.4 per cent higher grain yields than IR 20 and CO 43 respectively.

At Madurai, a gall midge resistant culture ACM 8 (IR 8 XW. 1263) with semidwarf, high tillering and non-lodging habits has been evolved. Its duration is 120-125 days and is earlier than IR 20 by 5 to 10 days. It is suitable for the tail end of Periyar-Vaigai ayacut area which is endemic for gall midge. Its average yield is 5 t/ha

In the evolution of a high yielding short duration variety to replace IR 50 for *navarai* and *sornavari* seasons five cultures, viz., TM 4307, TM 4309, TM 4428 and 4438 of the cross BAM 3/IR 50 have been identified with fine grain quality and tolerance to blast (score 1.8) at Tirur.

Crop Management

Green manure application at 12.5 t/ha to I rice crop and long stubble (30 cm) incorporation for the II rice crop along with the application of 50 kg P_2O_5/ha as super phosphate to both the crops gave the highest total grain yield of 12.7 t/ha (I & II crops) for the rice-rice system.

Pre emergence application of pendimethalin at 1.25 kg a i/ha followed by one manual weeding was effective for weed control and give high grain yield of 5.5 t/ha. It was followed by oxadiazon at 0.75 kg a.i. / ha. The major weed flora of the experimental field comprised *Echinochloa crusgalli*

Echinochloa colonum in annual grasses and *Cyperus difformis* and *Cyperus iria* in annual sedges.

Green manuring, planting 80 hills/m² and application of 150 kg N/ha gave the highest yield of 7.9 t/ha in *Kharif* rice IR 50. The net return obtained in that treatment was Rs. 12,954 with the B : C ratio of 3.21. During *rabi* season, the yield of variety IR 62 was the highest (6.6 t/ha) with the treatment combination of green manuring, 50 hills/m² and 100 kg N/ha. This combination gave the highest net return of Rs. 9092/ha, and B : C ratio was 2.63.

Among the three sources of N, viz. urea super granules, phenylphosphoro diamide urea and prilled urea, USG was the best with the highest N recovery percentage of 42.55. Instead of applying the recommended dose of 100 kg N/ha as urea 75 kg N ha as USG is recommended.

ADT 37 seeds have a dormancy of over 50 days. To break the dormancy, seeds may be soaked overnight in 0.50% solution of potassium nitrate (one litre per one kg of seeds) and kept in a dark place after draining the solution and covered with wet gunny or wet straw.

Experiments conducted at Thanjavur indicated that groundnut-rice-groundnut sequence was the best for the new delta area with the highest net return of Rs. 25,910/ha and water requirement of 1441 mm. Groundnut-rice-blackgram-greengram sequence was the next best with a net income of Rs. 20,471/ha and water requirement of 1561 mm. The conventional rice-rice-cotton sequence recorded a net return of Rs. 19,390 with a water requirement of 2065 mm.

Application of 6 kg of peat inoculum in three equal splits through seed, root and soil resulted in maximum grain and straw yields in both the seasons at Aduthurai.

A field experiment conducted at Madurai with direct sown CO 37 rice revealed that maximum grain yield of 3010kg/ha was obtained at 100% recommended N *plus* seed treatment and soil application of *Azospirillum* (seed treatment with 2 kg and soil application with 4 kg of peat based inoculant). Seed hardening with KCl did not affect the seeds treated with *Azospirillum*. The grain yield was 10-15% higher when *Azospirillum* was combined with seed hardening. The yield was also highest (7816 kg/ha) in this treatment.

In sodic soil, application of gypsum at 50% requirement in combination with 25 kg of $MgSO_4$ and 5 t of *Vadanarayana* leaf per ha recorded a grain yield of 3.8 t/ha in Puduvai Ponni rice as against 1.5 t/ha in control.

Addition of raw coir pith at 10 t/ha along with 50% gypsum requirement and recommended dose of NPK increased the grain yield of rice in sodic soils by 62% and 27% over NPK and NPK+gypsum treatments respectively. The soil pH was reduced from 9.7 to 8.2 and exchangeable Na from 2.65 to 1.90 me/100 g of soil.

In the direct sown rice crop of CO 43 application of 100 : 50 : 50 kg NPK/ha recorded the highest grain yield of 4.3 t/ha.

A study on root distribution characteristics of paddy crop mechanical compaction in submerged soil (fluffy nature) showed that compaction with eight passes with 400 kg stone roller enhanced the root distribution pattern in the surface layer by 13% over uncompacted control. The yield of rice increased by 25% owing to compaction of soil and improvement of the root distribution pattern and nutrient uptake.

Ponni and CO 43 were able to tolerate low light intensity and could give high yields whereas IR 20 was susceptible resulting in poor yields. Bhavani and white ponni were found to be medium tolerant varieties.

In the old delta of Thanjavur district, castor (SA 2) and sunflower (K 2) raised under irrigated condition during summer season recorded yields of 2095 kg/ha and 1250 kg/ha respectively with net incomes of Rs 5679/ha and Rs. 5840/ha respectively. Under rainfed condition sorghum CO 26 yielded 2675 kg of grain and 7 t of fodder per ha while gingelly (TMV 4) gave 539 kg/ha.

Crop Protection

Ovicidal action was more pronounced in the insecticidal treatments viz., carbosulfan and phosalone against BPH, WBPH and GLH. Monocrotophos, fenthion and phosphamidon showed high ovicidal activity against yellow stem borer and leaf folder. The ovicidal action will be helpful in reducing the pest population under field conditions.

Application of neem oil 2% as high volume spray (HV) was highly effective in checking the rice leaf folder damage and gall midge incidence. HV application of 1% or 3% or low volume (LV) application of 5% or 10% neem oil reduced the brown plant hopper population and earhead bugs. They were found to be on par with phosphamidon and endosulfan.

Complete protection of rice crop from rat damage was obtained with low voltage electric fence at Aduthurai. The approximate cost of the unit for one cent area will be Rs. 450/-.

Natural large scale outbreak of predatory beetles in paddy and sugarcane fields occurred in a few villages of Coimbatore district. The insect was identified as *Psederus fuscipos* (Staphylinidae : Coleoptera). Insects were brightly coloured with black sclerotized head, red thorax and few bluish abdominal segments. They were very active nocturnal hunters in habit and could swim in water. They occurred in the paddy fields, field bunds, cracks and crevices in the soil and in trashes of crops. The adult beetles preyed on egg, larvae and adult stage of pests of crops. They secreted toxic substances cutaneously or from their pygidial glands. These substances caused blisters on the skin which subsidised in 3-4 days.

In a chemical control trial, plots treated with chlorpyriphos 500 g a.i./ha had 3.22 per cent silver shoot while the untreated control plot had 9.90 per cent. However, parasitization by *Platygaster* sp was 50 per cent in untreated control while it was 26.6 per cent in chlorpyriphos indicating mortality of parasites due to the insecticide spray.

Studies on the seasonal incidence of *S. biformis* in the nursery revealed that

the maximum population occurred in the second fortnight of September and the lowest in the first fortnight of March. A highly significant positive correlation existed between the population of thrips and the damage in the nursery, the 'r' value being 0.82.

The population and damage by thrips in the nursery were positively correlated with the evening relative humidity and negatively with sunshine hours while other weather factors had no significant relationship. In the transplanted crop, the maximum population was observed in the month of August while the lowest was in March

Field studies on leaf folder complex at Coimbatore revealed that there were two species of leaf folder/roller viz., *Cnaphalocrocis medinalis* and *Marasmia natnalis*. Among these, *C. medinalis* was 30.4% in November, 87, 75.4% in December, 87, 62.9% in January, 1988 and 63.5% in February, 88.

The wolf spider, *Lycosa pseudoannulata* is a potential predator of a number of pests of rice viz., BPH WBPH, GLH, leaf folder larvae and yellow stem borer moths. Carbofuran 3 G (1 kg ai/ha) and foliar sprays of phosalone, fenitrothion, monocrotophos, endosulfan and phosphamidon at 0.5 kg ai/ha were found to be safe to the spider in the order mentioned under field conditions. Among the dust formulations BPMC and phosalone were safe. Neem oil and neem seed kernal extract were also safe to the spider and can be used as selective insecticides. Application of herbicide butachlor @ 1.5 kg a i/ha had no adverse effect on the predatory spiders.

Nine varieties compared under partial up-land and low-land conditions for their susceptibility to blast indicated that the disease intensity was significantly high in all varieties. This indicated that when the conditions require the cultivation of direct sown rice intensive monitoring of the disease has to be taken up. Seed treatment with fungicides against blast is recommended for direct sown crop.

Treatment of paddy seeds with carboxin or carbendazim 4 g/kg followed by foliar spray of edifenphos 0.1% immediately on noticing disease symptoms significantly reduced blast disease in the nursery by 69.8% and 59.8% respectively.

A simple trap fixed on leaves of rice plant could trap spores of *P. oryzae* more effectively than the sticky trap. With sticky trap more number of spores were trapped in horizontal position than in vertical position. More number of *P. oryzae* spores were trapped during night time since the release of spores from conidiophores occurred during 2.00 to 9.00 a.m.

Loss of weight due to grain infection was assessed in comparison with the weight of uninfested seeds at Pondicherry. The reduction in grain weight upto disease grade six was 4.1%. The yield loss for grade 7 and 8 was 10.1% and 24.6% respectively. For grade 9 the loss was 47.3%.

Leaf extracts from 19 plant species were tested for their antiviral activity against RTV by applying them prior to inoculation. Among them *notchi* leaf extract reduced the per cent of infection to 30 as against 90 in control.

MILLETS

SORGHUM

Crop Improvement

Promising cultures

A new sorghum hybrid 7325 (296A x TNS 30) has been found to be high yielding with an average grain yield of 5350 kg/ha and straw yield of 15.9 t/ha under irrigated conditions at Coimbatore.

A high yielding culture TNS 31/1 (771 x MS 8271) is promising with an average yield of 4294 kg/ha in 100 days as against 3875 kg/ha in 105 days by CO 26. It possesses moderate resistance to stem borer.

Crop Management

Studies conducted in calcareous soils of Coimbatore district indicated 9.5 ppm to be critical level of Fe. Basal application of 50 kg of $FeSO_4$/ha along with 10 t of FYM/ha or 1% foliar spray of Fe SO_4 along with 0.1% citric acid thrice (30, 45 and 60 DAS) during the crop growth was effective when Fe content in calcareous soil fell below 9.5 ppm. The grain yield was 4.2 t ha when Fe was supplied through soil and foliar application while the control recorded only 3.4 t/ha.

Studies conducted in calcareous soils of Coimbatore and Periyar districts indicated 1.7 ppm to be the critical level. Soil application of 25 kg $ZnSO_4$/ha or 0.5% foliar spray of $ZnSO_4$ thrice (30, 45 and 50 DAS) during the crop growth will be effective whenever the Zn content in calcareous soils falls below 1.7 ppm. The yield obtained with soil and foliar application of $ZnSO_4$ was 4.22 and 4.17 t per hectare respectively while the control recorded only 3.72 t/ha.

Sorghum intercropped with sunflower at 4 : 2 ratio registered the maximum net return of Rs. 4279/ha with a benefit-cost ratio of 2.13 in vertisol of Coimbatore under rainfed condition. Hence, sorghum - sunflower intercropping in 4 : 2 ratio can be recommended for vertisols.

Sorghum intercropped with soybean in 4:2 ratio (soybean at 2.6 lakh plants/ha) recorded the highest net return of Rs. 5914 and Rs. 5637/ha with a return of Rs. 3.62 and Rs. 3.35 per rupee invested in *kharif* and summer respectively.

Studies on integrated nutrient management of sorghum with intercrop of cowpea under dryland conditions at Aruppukkotai revealed that application of farm yard manure at 12.5 t/ha and *Azospirillum* (soil and seed treatment) to sorghum along with 40 : 40 : 0 kg of NPK / ha in sorghum + cowpea intercropping system gave 2426 kg of sorghum and 88 kg of cowpea/ha. The net return and B-C ratio were Rs. 4398/ha and 3.35 respectively. The sole sorghum yielded 2880 kg of grain/ha and net return of Rs. 3919 with a B-C ratio of 3.12.

Kaolin 3% spray at grand growth phase in sorghum was effective for drought tolerance at times of prolonged drought in Alfisol.

At Trichy, grain and straw yields of sorghum increased significantly by the application of FYM, rice husk and pressmud at 5 t/ha in rainfed sorghum

(CO 25) in *Adipattam* (August sowing) Out of the three organic wastes, FYM gave the highest yield of 1730 kg/ha of grain and 12.43 t/ha of straw. Application of cumbu earhead waste had a deleterious effect on the grain yield of sorghum.

Results of the permanent manurial experiment at Kovilpatti revealed that application of 100% recommended K and P at 40 and 20 kg/ha respectively through inorganic source with $ZnSO_4$ at 25 kg/ha resulted in highest grain yield of K-Tall sorghum under rainfed conditions. This was followed by 100% recommended N and P alone.

Crop Protection

Acaricides *viz.*, dicofol 18.5 EC, tetradifon 8 EC and wettable sulphur 80% WP at 1.51, 1.25 and 3.75 kg/ha, respectively gave good control of the mite *Aceria sorghi*.

The population of legume aphid *Aphis craccivora* was significantly reduced on the intercrop lablab with sorghum, samai and ragi with a mean population of 30.5, 31.4 and 48.8 per cent as against 73.8 per plant in pure crop of lablab.

Experiments carried out on sorghum CO 25 to find out the most susceptible stage of the plant growth for eriophyid mite, *Aceria sorghi* occurring in association with the top rot disease, indicated that the mite preferred sorghum plants in the early vegetative stage when compared to late maturing stage.

CUMBU

Development of male sterile lines

A dwarf male sterile line MS 732A was developed by paired crosses and by selection for yellow anthered plant types. The genetically reconstituted 732A was utilised in hybridisation. The MS line was completely free from pollen shedders and used in the production of national hybrids like MH 179. This is highly resistant to downy mildew. The stability of male sterility was tested in many locations and found to be stable.

Crop Management

At Aruppukottai, soaking cumbu seeds either in 2% KCl or NaCl for 16 hours followed by five hours shade drying increased the grain yield by 329 kg/ha and 280 kg/ha respectively over control. The additional income obtained through seed treatment was Rs. 649/ha and Rs.552/ha respectively.

MAIZE

Crop Improvement

Promising lines

Hybrid UMH 9 (UMI 810 90) recorded a mean grain yield of 3851 kg/ha which was 7% and 20% more than Ganga 5 and CoH 1 respectively. It matured in 95-100 days and reached a height of 250 cm. Under irrigated conditions the yield potential was 6000 kg of grain/ha and 10 t/ha of straw. It is resistant to downy mildew. It is suited for cultivation in all the maize growing tracts of the state.

Crop Management

For maximisation of yield in maize 1,10,000 plants/ha with application of NPK at 275.0 : 135.5 : 120.0 kg/ha was optimum in *kharif* season whereas in summer NPK at 200:100:80 kg/ha with

1,10,000 plants/ha was advantageous at Coimbatore.

Transplanting five day-old seedlings was superior to direct seeding, recording an increase of 7.7 q/ha and 5.6 q/ha during *kharif* and *rabi* respectively. The highest net return and return per rupee invested were also obtained with transplanting 5 day old seedlings.

A study on the response of hybrid maize (UMH 9) to population levels and fertilizer doses during *kharif* and summer 1986-87 under irrigated condition at Coimbatore indicated that maximum grain yield of about 10 t/ha was obtained with 110,000 plants per hectare in both *kharif* and summer. The interaction was also significant with 1,10,000 plants/ha and high fertilizer levels (275.0 : 137.5 : 120 kg NPK/ha in *kharif* and 200:100:80 kg/ha in summer) recording the maximum yield of over 10t/ha).

Crop Protection

Studies conducted on the influence of lablab, cowpea, greengram, blackgram and redgram on the incidence of stem borer, *Chilo partellus* on Ganga 5 maize showed that paired rows of maize alternated with lablab or cowpea significantly reduced the damage by the pest.

RAGI

Crop Improvement

Variety Released

CO 13: This is a short duration (95-100 days) variety with a mean yield of 3000 kg / ha under irrigation. The number of fingers per panicle ranges from 10 to 17 and productive tillers from 3-5. It has thrashability, synchronising maturity of earheads and non-lodging tendency. It is highly field tolerant to blast. This is suited for both *kharif* and summer seasons.

Promising cultures

The entry JNR 981-2 from Kovilpatti recorded high yields consistently for the past five years. The average grain yield was 2743 kg / ha with an increase of 16% over the check K 5 (2300 kg/ha).

Crop Management

Spraying 5% NaCl solution at 85th and 95th days was very effective in significantly mobilising the stem and leaf carbohydrates in grain.

Studies on the response of rainfed ragi (MR 1) to micronutrients at Paiyur revealed that application of zinc at 3.5 kg/ha and copper at 2.5 kg/ha was optimum. Iron did not have any effect.

The fertilizer prediction equation developed based on STCR approach was test verified in the farmers' holdings in Periyanaickenpalayam series. The results showed that cent per cent achievement could be obtained upto the yield target of 3.5 t/ha. The per cent achievement at high yield target of 4 t/ha was in the range of 85 to 90 for mixed black soil of calcareous nature.

Combined application of 100% NPK and FYM at 10 t/ha recorded the highest grain yield of ragi in ragi-maize-cowpea cropping system besides improving the soil available N and P status, population of micro-organisms and activation

of soil enzymes. Continuous application of N alone depleted the soil native P and the yield recorded was on par with that of control plot. The yield reduction in these treatments over NPK + FYM treatment ranged between 72.8 and 82.0%.

Crop Protection

In the screening trial, seven ragi cultures, *viz.*, HR 6-27-1, MR 3, OVAT-2, WR 15, GE 568, GE 844 and GE 1834 showed moderate resistance to both leaf and finger blast infection (less than 10% finger blast and 20% leaf blast) while susceptible check recorded more than 40% finger blast and 50% leaf blast.

SMALL MILLETS

Crop Improvement

Samai

Promising lines

Entries PRC 10 and PRC 11 recorded high grain yields of 297 and 338 kg/ha, which were 10% and 16% higher than the check K1. PRC 8 recorded the maximum yield of 365 kg/ha which was 26% and 14% higher than CO 2 and K1 respectively.

Entry SLA 2533 recorded significantly high yield of 2834 kg/ha which was 30% higher than the check K3 (2179 kg/ha). Entry TNAU 43 had performed well yielding 1318 kg/ha, which was 7% and 22% more than K3 (1236kg/ha) and CO 5 (1081 kg/ha) respectively.

Panivaragu

Entry MS 5038 recorded 48% and 58% more yield than the checks K1 and CO 2 respectively. MS 1685 recorded a grain yield of 711 kg/ha, which was 20%, 92% and 37% higher over the checks K2 (592 kg/ha), K1 (370 kg/ha) and CO 5 (518 kg/ha) respectively.

Crop Management

Samai

July - August (first week) was found to be the optimum time of sowing for rainfed samai. With delayed sowing, yield was considerably reduced in proportion with the delays.

PULSES

REDGRAM

Crop Improvement

Promising lines

Culture CORG 5 (CO 1/T 21) with medium maturity period (120-125 days) and photo insensitivity recorded a mean grain yield of 1020 kg/ha during *Kharif* 1987-88 as compared to 940 kg/ha in CO 5. It combines drought tolerance and field resistance to wilt and root rot. Two cultures CORG 12 (Sel from (AS 3), and CORG 4 (SAI-25 KR-3-1) of long duration are in MLT to replace SA 1.

Crop Protection

Three entries viz. MA 166, DA 11 and Bahar were resistant to redgram sterility mosaic both in field and artificialy inoculated conditions.

BLACKGRAM

Crop Improvement

Variety Released

ADT 5 blackgram : This is a pureline selection from 'Kanpur' blackgram,

suitable for cultivation in April season as an irrigated crop in the new delta area of Thanjavur district. It is capable of yielding 1500-2000 kg/ha in 70 days. It can putforth a productive second flush in an extended period of 15 days duration. It is tolerant to yellow mosaic, leaf crinkle and root rot diseases.

Promising lines

The cultures COBG 301 (CO 4/P7) and CG BG 302 (4/1792) combine earliness and high yield of 1570 kg/ha and 1415 ks/ha respectively.

Crop Management

Among five herbicides, isoproturon 0.5 kg/ha + hand weeding (HW) and pendimethaline 0.75 kg/ha + hand weeding were effective in the control of broadleaved weeds at Coimbatore. Highest grain yield of 1170 kg/ha was obtained with isoproturon 0.5 kg/ha followed by one hand weeding on 40th day after sowing and was comparable with pendimethalin (0.75 kg/ha) coimbined with one hand weeding.

In early maturing cultivars like T9, application of benzyl adenine at 40 ppm level on 45th day induced post - ponement of sensescence and enhanced the grain yield by about 18%. In late maturing indeterminate types like CO 5, application of ethrel at 600 ppm during 65th day increased grain yield by distintegrating photosyn thetic apparatus and facilitating translocation of assimilates from leaves to developing pods.

Spraying 1.0% potassium sulphate at stray flowering increased water status of the plant and chlorophyll content.

Among seven rhizobium strains screened for their effectiveness in blackgram (CO 4), inoculation with strain COB 11 increased the grain yield by 21% (527 kg/ha) over uninoculated control (436 kg/ha), while inoculation of the standard elite strain BMBSP 47 also increased the grain yield by 17% (509 kg/ha).

Crop Protection

Nine different substrates were tested for mass multiplication of *Trichoderma viride* and *T. harzianum*. Maximum growth and colony forming units/g. of substrate were produced by *T. viride* on tapioca rind followed by tapioca rind + peat soil (1 : 2).

There was reduction of 61-69% in the incidence of root rot of blackgram by adding *T. viride* or *T. harzianum*.

The field trials at Aruppukkottai revealed that the efficiency of *Rhizobium* seed treatment on blackgram was not affected by the seed treatment with fungicides (carbendazim at 2 g/kg or TMTD at 2 g/kg) or insecticides (monocrotophos at 5 ml/kg or chlorpyriphos at 5 ml/kg) or combination of both.

Economic threshold studies of blue butterfly larvae on blackgram pods indicated that for every increase of one larva there was 7.9 per cent pod damage and 0.5 g of grain loss.

Carbosulfan 1% seed treatment recorded significantly low galeuricid beetle infestation. while chlorpyriphos seed treatment (5 ml/kg of seed) registered the minimum stemfly incidence

With regard to grain yield, soil application of phorate at 1 kg ai/ha followed by monocrotophos 0.04% spray recorded higher yield than other treatments.

GREENGRAM

Crop Improvement

Variety Released

ADT 3 greengram : This is a hybrid derivative of the cross H-70-16/ Rajendran/F. 65. it is suitable for January sowing in rice fallows. This is capable of yielding 1000 - 1200 kg/ha and has a duration of 65-70 days. It is tolerant to yellow mosaic virus and stemfly.

Promising cultures

At Kovilpatti, two entries namely KGG 346 and KGG 371 gave high yield of 1511 kg/ha and 1508 kg/ha respectively. This was 9% higher than CO 4 which gave 1377 kg/ha.

Three promising greengram cultures viz. CD 2-83-5, CoGB-2 (70 days) and VGG. 2 have been promoted for ART during 1988-89.

Crop Management

Greengram aud blackgram seeds coated with a paste made of ash (500 g/kg of seeds) + 3% gum followed by five hours shade drying gave an increased grain yield of 158 kg/ha and 140 kg/ha over control respectively. The pre-monsoon sowing after the above seed treatment was found effective in drylands. The cost of seed treatment for both greengram and blackgram was only Rs. 5/ha.

In early maturing greengram varieties spraying benzyl adenine at 20 and 40 ppm at peak flowering delayed sensecence and increased seed yield by increasing dry matter accumulation and pod yield. In late maturing cultivars like CO 4, spraying ethrel at 300 and 600 ppm induced senescence and thereby increased the pod yield.

Irrespective of method of application, potassium increased leaf water potential, transpiration, leaf chlorophyll and photosynthetic rate which resulted in increased pod yield. Spraying K_2SO_4 (1.0%) is better than spray-KCl (1.0%)

The comparative efficiency of rice gruel, jaggery solution and water sticker in the *Rhizobium* seed treatment was assessed. Rice *Kanji* increased the load of *Rhizobium* on the seed at 12, 24 and 48 hrs after inoculation compared to jaggery and water. It also increased the nodulation, nodule dry weight and plant dry weight in greengram.

Crop Protection

Field experiments with granular insecticides, viz., carbofuran and phorate at 1.0 kg ai/ha and spray formulation viz., phosphamidon 85% WSC at 250 ml/ha for the control of pests on greengram indicated that foliar application of phosphamidon at 250 ml/ha on 15 and 25 days after sowing was as good as that of granular application in controlling the stemfly, *Ophiemyia phaseoli* and the whitefly, *Bemisia tabaci* and it was the second best chemical in reducing *Aphis craccivora* and leaf hopper.

Carbofuran or phorate at 1.0 kg ai/ha applied in the soil at sowing significantly reduced the leaf damage by the galerucid, beetle, *Madarasia obscurella* up to 14 days after sowing. The treatment was also effective against the aphid *Aphis craccivora*, the leafhopper *Empoasca kerri* and the whitefly, *Bemisia tabaci* upto 42 DAS and reduced the leaf crinkle and yellow mosaic virus diseases resulting in high yield in greengram.

Incidence of yellow mosaic in greengram was low (5.4% and 6.0% respectively) in plots which had maize and pearl millet as barrier crops When endosulfan 0 07% was sprayed 15 and 25 DAS, the incidence of disease was reduced further. It was noticed that maize and pearl millet barrier recorded less disease compared to sorghum barrier. Maize and pearl millet barriers prevented the free movement of the whitefly.

When 8 - 10 day old greengram plants were sprayed with fresh butter milk as well as that fermented for 24, 48 and 72 hours and inoculated with viruliferous whitefly, buttermilk fermented for 48 hours reduced the incidence to 20% as against 55% in control.

The genotypes IC 9138 was found to be resistant to both root-knot nematode, *Meliodogyne incognita* (gall index 1-2) and the reniform nematode, *Rotylenchulus reniformis* (1 - 10 females/plant). The genotype IC 9125 was found to be resistant to *M. incognita* (gall index 1-2).

BENGALGRAM

Crop Improvement

Bengalgram CO 3 is a bold grain variety maturing in 85 days under rainfed condition. It recorded an average yield of 950 kg/ha. It has field tolerance to root rot and virus disease. It was able to tolerate terminal drought which prevailed during the crop period.

Promising cultures

Culture ICCV. 2 has been identified as photoinsensitive and suitable for May-June sowings.

ICRISAT culture ICCC 83120 has recorded a yield of 1480 kg/ha.

Crop Management

Among herbicides tested, fluchloralin (0.75 kg/ha) and pendimethalin (0 75 kg/ha) were equally effective in controlling the weeds.

SOYBEAN

Crop Improvement

Promising Cultures

At Paiyur, UGM 33 recorded a mean yield of 872 kg/ha and less incidence of mosaic disease and leaf miner.

Culture UGM 37 (NIM 504-7 x OO 7) has recorded a mean yield of 1004 kg/ha which was 12.3% more than check CO 1.

Culture UGM 21 (70 days duration) suitable for intercropping has given almost the same per day yield (10 kg/ha day) as that of CO 1 (11 kg/ha/day) which is of 90 days duration.

Crop Management

Pre-emeregnce application of metalachlor, oxyfiourfen, oxadiazone, fluchloralin and pendimethalin was compared with hand weeding twice and unweeded check. Besides handweeding twice, fluchloralin 1.55 kg, oxadizon 1.00 kg and pendimethalin 1.50 kg as pre-emergence was effective for the control of broad leaved weeds. Pendimethalin at 1.50 kg and fluchloralin at 1.25 kg also controlled grasses effectively and were not effective against sedges. Hand weeding twice gave the highest grain yield. Among the herbicide treatments, fluchloralin at 1.25 kg/ha followed by pendimethalin at 1.50 kg/ha gave high grain yields.

HORSEGRAM

Crop Improvement

Variety Released

Paiyur 1 : This strain has recorded 642 kg of grain per hectare and 1028 kg of *pottu* (haulms) in 105-110 days. High *pottu* yield and resistance to yellow mosaic and root rot diseases are the advantages of this strain. Being a medium duration strain, it is best suited to the existing dryland crop rotations where horsegram is a component.

Crop Management

At Paiyur, the performance of horsegram was better in groundnut-horsegram cropping sequence compared to samai-horsegram and ragi-horsegram systems. Application of N and P favourably influenced the horsegram yield and basal application of 5 kg N+10 kg P_2O_5/ha recorded the highest yield.

COWPEA

Promising cultures

Culture CO 2-1 has been identified as superior to CO 2 in grain yield with vegetable quality comparable to CO 2. Culture CoVu 623 has recorded 435 kg/ha compared to 399 kg/ha in KM 1.

Three promising Vamban cultures, viz., NPRC 1, NPRC 2 and NPRC 3 were advanced to All India coordinated trial.

At Kovilpatti, entry CoVu 382 recorded high grain yield of 927 kg/ha under rainfed conditions which was 18% higher than CO 4.

Crop Management

Continued use of 100% optimum NPK and FYM at 10 t/ha over a period of 15 years recorded the highest grain yield of cowpea (33rd crop 525 kg/ha) and increased the fertility status of the soil. Continuous application of K however had no significant effect on the yield of cowpea. There was a depletion in the status of soil native P when N alone was continuously applied. Application of 100% optimum NPK + FYM increased the microbial population, enzyme activity, organic matter, total N content and available N and P status.

Crop Protection

Seventeen plant extracts were tried for the control of cowpea aphid-borne mosaic virus under pot culture conditions. Pre-inoculation and 10 per cent water spray of *Mirabilis jalana* inhibited the virus to a maximum of 90% followed by *Bougainvil ea spectabilis* (85%), *Pisonia alba* (84%) and *Prosopis sp* (80%). When inoculum from

infected cowpea plants was fixed with juice of *Pisonia alba* and *Alternanthira echinata* (kaki weed) symptom development was delayed by 10 days. Teepol was used as emulsifier.

Spraying of NPV 250 LE/ha followed by two rounds of chlorpyriphos 0.08%, the first spray three days after NPV application and the second 15 days later, reduced *Spodoptera litura* damage by 98% besides recording high grain yield of 526 kg/ha.

Monocrotophos and chlorpyriphos seed treatments (5ml/kg of seed) followed by monocrotophos 0.04% spray registered significantly lower pod borer infestation than the other treatments, while dimethoate seed treatment (5 ml/kg of seed) followed by monocrotophos 0.04% spray recorded significantly higher grain yield than all other treatments.

LABLAB

Crop Improvement

Promising cultures

Colt. 22 registered 53% more yield than CO 9 and this higher yield was consistent in all the locations tried under irrigated conditions.

OILSEEDS

GROUNDNUT

Crop Improvement

Promising cultures

TNAU 115, a derivative of the cross TMV 9 x PP 44 gave an average yield of 2016 kg/ha as compared to 1846 kg/ha in CO 1.

VG 77, a cross derivative of JL 24 x CO 2 with a duration of 105 days recorded an average yield of 1760 kg/ha which was 23% and 19% higher than JL 24 and VRI. 1 respectively. Under irrigated conditions it gave 2815 kg/ha.

Culture VG 55 (JU x Reliout 33-1) with 90 days duration recorded an average yield of 1956 kg/ha as compared to 1922 kg/ha in JL 24 and 1744 kg/ha in CO 1. The per day productivity of this culture was 20.4 kg/ha as against 16.8 kg/ha in CO 1 and 15.6 kg/ha in JL. 24.

A semi-spreading culture VG 78, an inter-specific cross derivative of *A. hypogaea* x *A. cordinass*, maturing in 130 days recorded 2441 kg/ha as against 1823 kg/ha in TMV 10 check. This culture was tolerant to both late leaf spot and rust.

Crop Management

Pendimethalin (1.0 and 1.5 kg/ha) and fluchloralin (0.75 and 1.00 kg/ha) were effective in the control of annual grass weeds *Echinochloa colonum*, *Dactyloctenium aegypticum* and *Panicum repens*, at Bhavanisagar. Pre-emergence pendimethalin 1.0 kg/ha followed by late weeding recorded the highest groundnut pod yield of 3682 kg/ha as compared to 3121 kg/ha in manual weeding twice and 1818 kg/ha in unweeded control.

Under normal conditions check basin method of irrigation was found to be the best. Under conditions of water scarcity, broad bed and furrow method was found to be advantageous with 50% saving in water though the yield was reduced by 20%.

Application of amendments like, pressmud, coir waste, composted coir waste, paddy husk and groundnut husk improved the porosity and water holding capacity in red soils. Composted coir waste applied at 2.5 t/ha was found to be the best amendment with a yield of 966 kg/ha of pods.

Addition of magnesium sulphate at 30 kg/ha was found to increase the pod and haulm yield in groundnut. When magnesium sulphate (30 kg/ha) was applied for groundnut, half the recommended dose of K was found effective and on par with full recommended dose of K.

Crop Protection

Neem oil 2% and the moult inhibitor, diflubenzuron were promising as that of chlorpyriphos in controlling groundnut leaf miner. The yield was also on par with the standard insecticides.

Seed treating chemicals viz., carbendazim, mancozeb, TMTD and carboxin were tested for their compatibility with *Rhizobium*. The results revealed that garmination of seeds treated with all the four fungicides were on par and significantly superior over control. The fungicides did not inhibit *Rhizobium*.

Trichoderma viride and *T. harzianum* were found to be very effective in reducing dry root rot disease incidence. *T. viride* was more effective recording only 2% disease while *T. harzianum* showed 8% as against 32% infection in control.

Groundnut based cropping systems with soybean, redgram, greengram, cowpea, sunflower, cumbu and sorghum revealed that incidence of leaf hopper in the pure stand of groundnut was significantly higher than that in the mixed stands. There was no significant difference in the levels of thrips among the cropping systems.

Leaf miner population was significantly minimum in groundnut and cowpea/redgram system studied at Paiyur. This system also reduced leaf hopper population.

SESAMUM

Crop Improvement

Promising Cultures

Culture TNAU 23, a derivative of the cross A. 65 x CO 1 with a duration of 85-90 days gave an average yield of 720 kg/ha, the yield increase being 18% over CO 1. Two cultures, DPI 1525 and DPI 1526 from Paiyur recorded mean yields of 1445 kg/ha and 722 kg/ha during *Kharif* as compared to 565 kg/ha in CO 1. During summer DPI 1525 registered 833 kg/ha while DPI 1526 recorded 860 kg/ha as against 716 kg/ha in TMV 4, the best check.

SUNFLOWER

Promising cultures

One hybrid TNAU SH. 1, from Coimbatore has recorded a mean yield of 1499 kg/ha as compared to 1144 kg/ha in CO 2, the increase being 27%.

One population KSC. 22 from Kovilpatti obtained in the cross Sun Rise x KSF 3 registered a mean yield of 900 kg/ha as against 729 kg/ha in K1.

Crop Management

For sunflower (Morden) N application at 60 kg N/ha in three splits (25% as basal, 25% at button and the remaining 50% at flowering) was found to be beneficial with a high yield of 1467 kg/ha.

Sunflower plants inoculated with *Azospirillum* and VAM fungi individually or in combination with two levels of phosphorus increased the seed yield of sunflower ranging from 0.5 to 13.5% when compared to uninoculated control.

Experiments conducted at Kovilpatti revealed that the critical period of crop-weed competition for rainfed sunflower was between 15 and 32 days.

Sunflower seeds of seven varieties including the imported Russian varieties viz., Peredovik, kharkov-50 and Kharkov-101 and 11 hybrids including Pochin-F1 grown at Coimbatore were tested at Bio-chemistry Department, Coimbatore for their oil contents. On comparison with the oil content of the original seeds, a reduction in oil content ranging from 3.5 to 17.0% was noticed. This indicates the effect of climate, soil type etc., on the oil content of sunflower seeds.

Crop Protection

The incidence of *Alternaria* leaf spot was minimum (4.6%) in the crop sown on July 1st. while the highest (13.1%) was in the crop sown on 15th July. Similarly the incidence of head rot was minimum (5.5%) in the crop sown on 15th July while the maximum (9.6%) was in the case of sowing on 1st July.

CASTOR

Crop Improvement

Entries TVC 11 (Aruna x HO. 4) and TVC 15 recorded 14.8% and 22.2% increased yield over TMV 5. TVC 11 recorded a mean yield of 983 kg/ha which was 41% higher then SA 2.

Crop Management

Increase in seed yield due to *Azotobactor*, *Azospirillum* or VAM fungi inoculation ranged from 2.5 to 14.6%. Maximum seed yield (11.30 kg/ha) was recorded in *Azospirillum* inoculation followed by *Azotobactor* (1086 kg/ha).

COCONUT

Crop Improvement

Variety released

VHC 2:A new T x D coconut hybrid combination of East Coast Tall (ECT) x Malaysian Dwarf Yellow (MDY) was released for cultivation. It recorded 104 nuts/tree and surpassed both ECT and VHC 1 in yield.

Crop Management

Six green manure crops, viz., desmodium, desmanthus, cowpea, kolinji, daincha and sunnhemp were raised in 1.8 m diameter circular coconut basins. Desmodium gave the highest yield of 12.80 kg/basin followed by sunnhemp with 7.46 kg/basin on fresh weight basis. Lowest yield was given by desmanthus (1.70 kg/basin).

A trial on the efficacy of bromadiolone 0.005% and rodacake 0.025%

showed a reduction of 88.2% damage by rodents in bromadiolone 0.005% and a reduction of 52% in rodacake 0.025% as against the control.

In the on farm trial conducted at Maravakkadu, the palms treated with 5 kg of neem cake, 50 kg of farm yard manure, 1% bordeaux mixture (40 litres) and 2 g of aureofungin + 1 g of copper sulphate showed less increase in disease index than the control palms. In more than 50% of the treated palms, bleeding was arrested completely and the mortality was 26.7% as against 40% in control.

The extracts of banana rhizome and kolinji root were found to be highly inhibitory to the mycelial growth of *Ganoderma lucidum*, the causal organism of Thanjavur wilt under laboratory conditions.

At Vedaranyam, (Thanjavur district) it was observed that gardens intercropped with banana remained free from Thanjavur wilt disease while the infection was upto 3.6 per cent in the garden without banana as intercrop.

MUSTARD

Crop Improvement

Promising Cultures

The variety Seetha (B-85) recorded a mean yield of 590 kg/ha over two years in seven locations of Tamil Nadu. This was followed by B. 54 (462 kg/ha). Due to their superiority in performance, these two are currently being evaluated in 35 locations in seven districts in farmers' fields through the Department of Oilseeds.

Crop Protection

Spraying bacterial insecticides Bactospeine @ 300 g ai/ha effectively controlled the larvae of diamond back moth, *Plutella xylostella* on mustard, but was not effective against the leaf caterpillar *Crocidolomia binotalis*. However *C. binotalis* was effectively controlled by spraying either endosulfan @ 600 g ai/ha or monocrotophos @ 425 g ai/ha.

NIGER

Crop Improvement

At RRS, Paiyur, six genotypes of niger and local were evaluated to identify suitable type for inter and pure cropping in Hosur and Dunkennikotta taluks of Dharmapuri districts and other hilly areas. The culture RCR 290 recorded high yield by 30% over locel type and also matured earlier (80 days).

COTTON

Crop Improvement

Variety Released

MCU 11 : This has a yield potential of 22 q/ha representing 23.2% increase over MCU 5 and 24.6% over MCU 9. The ginning percentage is 34.6 which is 3.2% more than MCU 5. It possesses a fibre length of 31.5 mm and comparable to MCU 5 and MCU 9. It comes to maturity in 155 to 160 days, which is 10 to 15 days earlier than MCU 5 and MCU 9.

Promising Cultures

Culture DPI 24/81, (hybrid derivative of MCU 10 x SRT. 1) is a medium staple cotton giving a mean yield of 932 kg/ha of kapas under rainfed conditions and maturing in 150-160 days.

The mean halo length is 24 4 mm with 36.6% ginning out-turn.

Culture TKH 497, had a mean yield of 1915 kg/ha as against 1406 kg for MCU 10 and 1464 kg for LRA 5166. It possessed a ginning outturn of 38.4% and fibre length of 24 8 mm.

Two medium staple cultures, viz, TSH. 162 and TSH. 164 developed at Srivilliputhur registered 1659 kg/ha and 1885 kg/ha respectively as compared to 1430 kg/ha by MCU. 7.

Crop Management

Integrated weed management studies in cotton-blackgram intercropping system under rainfed conditions revealed that pre-emergence application of thiobencarb at 1.5 kg ai/ha with one weeding with *sethuki* on 40th day controlled weeds effectively and recorded 10 67 q/ha of cotton and 5 23 q/ha of backgram with a B-C ratio of 3.24.

Blackgram KB 51 was found suitable for growing as intercrop with cotton LRA 5166 at Aruppukkottai. This intercropping system gave a gross income of Rs. 16051/ha through a yield of 22.13 q/ha of cotton and 3.03 q/ha of blackgram with a B-C ratio of 5.35.

For MUC 10 cotton based intercropping system, Vamban-1 blackgram was found to be ideal with a gross income of Rs. 14,500/ha with a B-C ratio of 4.82.

Evaluation of MCU. 11 and MCU 9 and four greengram genotypes, viz, COGG. 407, COGG. 123, NPRG 3 and T. 44 for their compatibility for intercropping at coimbatore showed that combination of MCU 11 + NPRG 3 recorded the highest seed cotton yield of 1821 kg/ha and greengram yield of 253 kg/ha.

Among cotton-based multi-tier cropping systems involving sorghum/redgram in the top tier, cotton in the middle and blackgram in the bottom as third tier, cotton + redgram (four rows of cotton + one row of redgram) recorded the highest total yield of 1503 kg/ha (1187 kg of seed cotton/ha+316 kg of redgram/ha)as against of 1236 kg of seed cotton/ha in the pure stand.

Pre-emergence application of butachlor at 1.00 kg ai/ha was found effective in the control of most of the weeds in black soil and recorded maximum cotton yield and monetary return. This was comparable to the farmers practice of hand weeding twice on 25th and 40th DAS. However, considering the non availability of labour during the peak cropping season, pre-emergence application of butachlor would be economical and there would be a saving of Rs 125/ha

Crop Protection

Yellow sticky traps placed at four different heights from ground level, viz., 30, 60, 90 and 120 cm for monitroing whitefly population revealed that traps at a height of 30 cm from ground level had trapped more number of whiteflies than those at other heights. Maximum catch was 84 adults per trap per week during December, 1987. During June, August and December to January the catches were at peak.

Three sprayings on 70, 100 and 130 DAS with fenvalerate @ 0.075 kg

ai/ha in combination with mancozeb 0.20% or carbendazim 0. 10% recorded minimum incidence of bollworms and boll rot. The kapas yield was highest (22.8 q/ha) in fenvalerate-mancozeb treatment followed by fenvalerate + carbendazim treatment with 22.4 q/ha.

Life table studies on spotted bollworm, *Earias vitella* and American bollworm, *Heliothis armigera* on four species of cultivated cotton at Coimbatore revealed that *G. hirsutum* (MCU 9) and *G. herbaceum* (Tkho 4) and *G. arboreum* (K8) by both bollworms. Studies indicated the maximum mortality occurred in the early life cycle. Predation and dispersal, migration and unknown causes accounted for maximum mortality of early and late instars respectively. Parasites caused perceptible amount of mortality during immature stages.

Two rounds of application of synthetic pyrethroids, fenvalerate, cypermethrin and deltamethrin at 75, 100 and 150 g ai/ha respectively and endosulfan at 700 g ai/ha resulted in rasidue levels of 0.2 ppm for fenvalerate and cypermethrin, 0.1 ppm for deltamethrin and 1.00 ppm for endosulfan on seed basis which were below the toleranse level.

Application of NPV @ 460 LE / ha + endosulfan 500 ml / ha along with adjuvants viz, cotton seed powder 2.5% + jaggery 17.5% reduced the *Heliothis armigera* population as well as damage to cotton by the pest

Five fungicides were tested against grey mildew in the variety LRA 5166. Tridemorph 0.1% was superior in reducing the disease incidence followed by wettable sulphur 0.05%. Significant increase in yield (1781 kg/ha) was recorded only by Tridemorph sprayings. Others were on par with control.

SUGARCANE

Crop Improvement

Promising Cultures

Among the early season clones tested at Cuddalore, the clone C 84036 recorded significantly high juice quality of 12.93% CCS and high cane yield of 144.63 t/ha.

For the late season, the clone C 83006 was found promising with 78.6 t/ha of cane and 12.4% of sugar as against 76.7 t/ha of cane and 10.6% of sugar by CO 6304.

In the mid season, the clone C. 81393 has recorded 118.7 t/ha of cane yield with 14.2% CCS.

Crop Management

The biometric studies and formulation of selection indices for cane yield and sucrose content revealed that the cane-weight and leaf width were important components for cane yield, while the brix value, cane weight, cane diameter and leaf width were important for sucrose content.

Application of FYM (10 t / ha), green manuring with daincha or pressmud application (30 t/ha) increased cane yield by 11-15% over control at Madurai.

Highest cane yield of 127.7 t/ha was obtained with 240 kg N/ha as rock phosphate coated urea in combination with 10t of FYM/ha.

BETELVINE

Crop Protection

Neem cake (1.0 t/ha) alone or combination of carbofuran (0.25 kg ai/ha) and 0.5 t/ha of neem cake was found effective in reducing parasitic nematodes and causing yield increase. Saw dust at 2.0 t/ha + NPK at 150:100:50 kg/ha was found effective in increasing leaf yield.

Bordeaux mixture drenching with or without neem cake 1.0 t or neem cake 0.5t and carbofuran 0.75 kg ai/ha resulted in the highest reduction of nematode population and minimum wilt incidence besides increasing the yield of leaves.

FORAGE CROPS

Crop Improvement

Promising Cultures

Cumbu-Napier hybrid grass : Four hybrids, viz., CN 6, CN 7, CN 8 and CN 13 recorded 15.69, 54 98, 42.14 and 45.21 per cent increased green fodder yield over CO 1 respectively.

Deenanath : TNDN recorded 37.75 t/ha of green fodder yield and 9.00 t/ha of dry matter.

Cenchrus : The selection FS 391 (*Cenchrus glaucus*) performed well at Aruppukottai, Killikulam and Erode under MLT.

Fodder cumbu : TNSC - 1 fodder cumbu tested in 15 locations under co-ordinated trials recorded high yield of 31.36 t/ha on an average ranking fifth among 12 varieties tested. It performed well at Dhobi (Samestipur), Hyderabad, Urulikanchan, Delhi (ICAR) and Rahuri.

Maize : Three fodder maize composites viz., FMC 1, FMC 2 and FMC 3 recorded 17 63, 30.82 and 22.20 per cent increase over CO 1 respectively.

Tree fodders

Leucaena : Of the two species of *Leucaena* tested under rainfed conditions, *L. diversifolia* produced higher green fodder yield than *L. leucocephala*. The hybrids of *L. diversifolia x L. leucocephala* (Peru Malavi) as well as *L. diversifolia x L. leucocephala* (Malavi) yielded higher than *L. diversifolia x L. leucocephala* (MPKV Rahuri).

Crop Management

Planting two noded stem cuttings horizontally recorded 221 t of green grass/ha/year, followed by planting rooted slips (213 t ha/year) Stem cutting is preferred because of abundant availability and easy handling.

At Aruppukottai, under rainfed condition, the grass-legume mixture of *Cenchrus ciliaris* FS 391 and *Stylosanthes scabra* grown in the ratio of 2 : 1 recorded higher green fodder production of 22 t/ha, followed by siratro grown in association with *C. ciliaris* in 2 : 1 ratio.

Among the ten legume fodder crops/varieties tested at Paiyur cowpea FCP 2 and cowpea CO 5 registered the highest green fodder as well as dry matter yield under both rainfed and irrigated conditions.

SUBABUL

Crop Protection

Small plant bug called jumping lice (Psyllid) causing havoc to subabul plantations abroad was seen for the first time in India in Chengalpattu, Pudukottai, Trichy, Thanjavur and Coimbatore districts. The eggs, nymphs and adults were found in large numbers on the tender shoots. This insect desaped the plants and killed the shoots outright causing dieback. The adult insect, pale greenish yellow in colour is about 1.5 mm long and 0.5 mm broad. The adults jump and fly off rapidly even on slight disturbance. The young ones are minute nymphs feeding on the terminal shoots. Pruning the affected terminal shoots of the plants and spraying insecticides like endosulfan 0.07% or malathion 0.1% twice at fortnightly intervals will control the insect. The insecticide treated plants should not be fed to cattle for about two weeks.

TISSUE CULTURE

Rice

Rice anther culture is being done to evaluate callus induction and regeneration of plantlets both in *indica* and *japonica* varieties and their crosses.

Androgenic plants from more than 40 hybrid combinations were developed and transferred to the field for evaluation.

Saline resistance studies in different rice varieties like IR 50, Pokkali, and Dassel, etc. have been conducted and some salt tolerant lines developed through somatic cell culture are being evaluated under field condition.

Ten anther-derived lines from Ponni (Mashuri) were studied along with the parent ponni. Appreciabie reduction in duration (12 to 15 days) and plant height could be recorded in the anther derived lines when compared to the parent variety Ponni.

Seven anther derived cultures from the Fls of the cross Vaigai, x CO. 40 along with the check CO 43 were tested. All the cultures are semidwarf with fairly good number of panicles/hill. 433A R5 is resistant to blast and moderately resistant to RTV and bacterial leaf blight (BLB) and 433A-R6 is resistant to blast and moderately resistant to RTV, BLB and brown spot

COTTON

In cotton, inter-specific hybrid (*G. hirsutum* x *G. armourianum*) raised through embryo culture was grown in glass house. In morphology and flower characters, the hybird resembled its male parent. This hybrid produced bolls but seeds were not well formed. The interspecific hybrid was resistant to jassid and bollworm and also possessed restorer genes for the cytoplasmic male sterile lines.

SEED TECHNOLOGY

Rice

Drill box survey in IR 20 paddy revealed causes of production of poor quality seeds which can be remedied with the precautions listed below: Incorporation of old stubbles with thorough irrigation and ploughing, maintenance of isolation distance of three

metres, removal of off types at all stages, cleaning threshing floors and closing crevices with cement or clay, using only fresh or well cleaned used gunnies, cleaning the processing equipments and stacking bags to the prescribed heights without touching the walls.

Sorghum

The combination of four fungicides, viz., Bavistin, Fytolon, Captan & Dithane M 45 at 0.2% sprayed once before the anticipated rains and at the time of physiological maturity was found to be the best in controlling fungi, since no single fungicide was able to control all the fungi.

Seeds fumigated with aluminium phosphide (quickphos) @ 3.6 g/m^3 at the lowest moisture content of 7-8% recorded enhanced germination. Fumigating seeds at higher moisture contents of 11-12% and 15-16% resulted in decline in germination.

Upto two fumigations, the germination and vigour were found to be significantly better than the rest. Third and fourth fumigations resulted in drastic decline in seed quality parameters.

Groundnut

Soaking of seeds of CV JL 24 in 0.5% calcium chloride for 6 hrs or bavistin + thiram (1:1) solution or mere water followed by air drying for 10 hr resulted in high field emergence.

Decorticating the pods of groundnut CO 1 and JL 24 was optimum at low pod moisture content of 7 per cent.

Castor

In castor, physiological maturity was reached after 85 days of anthesis, with maximum germinatian percentage, protein and oil content and least free fatty acid (0.320%) indicating harvestable maturity after 85 days of anthesis.

The oil content and weight of seeds per receme was more in primary recemes when compared to secondary recemes. Hundred seed weight, germination, free fatty acid and protein content were not altered by the order of the recemes.

Cotton

One study involved covering the emasculated female flower with paper and soda straw tube (wax paper) before and after hand pollination for hybrid seed production in Varalaxmi cotton. The wax paper soda straw was found to be a good substitute for paper cover since it resulted in enhanced boll set besides being cheaper.

A field experiment was conducted in winter, 1986 with Laxmi as female parent and SB 289E as male parent with Mcnamara Wine sap as the marker plant at 5 m isolation distance from Laxmi. The study revealed that hybrid seed can be produced by leaving the emasculated female flowers uncovered with off types at only 0 02 per cent level well below the seed certification standards. This also increased seed yield per boll, 100 seed weight, seed recovery and germination.

Onion

Onion bulb with 1/4 cut, sprouted 14 days earlier required less number of days for anthesis and physiological maturity than the intact bulbs. The seed stalk height and the seed recovery percentage were also high.

Onion seeds lose viability after six weeks at 90% RH, after 10 weeks at 75% RH and after 13 weeks at 50% RH. At 35% RH there is no impairement of germination even after 13 weeks of storage.

Bellary Onion

Ten month old bellary onion seeds hydrated for four hours followed by drying registered significantly higher germination than the other durations. Further, the viability of seeds was maintained following hydration-dehydration treatment during the subsequent storage period

Cowpea

Significantly high values were recorded for pod length, breadth, fresh and dry weight of pod and protein content with the application of 37.5:75.0: 0.00 kg of NPK/ha. Highest germination, seedling length, dry weight and vigour index were recorded on 21st day after anthesis, the physiological maturity stage for harvest in CO 4.

The middle seeds recorded the highest 100 seed weight compared to distal seeds. Seeds from middle and distal portion of the pod exhibited better viability than proximal seeds under storage. Though the proximal seeds had the highest values initially, they underwent seed senescence intensively at subsequent stages.

The bottom and middle zones attained their physiological maturity 60 days after anthesis while that of top zone took 65 days. So the seed crop of cluster beans var. Pusanavbhazar could be harvested in 60-65 days after anthesis to set maximum quantity of high quality seeds. The optimum sieve size for processing was 10/64.

Fennel

The seed development and maturation studies conducted in fennel cv CO 1 revealed that the seed attained physiological maturity between 35 and 40 days.

Fennel seeds can be safely stored with captan and DDT treatment when packed in 730 gauge polyethylene for a long time

Fenugreek

Pod and seed development studies revealed that the seeds attained physiological maturity 45 days after anthesis with the seed moisture content of 20% and maximum germination (92%), dry matter production (8.3 mg/seedling) and vigour index value of 1892.

Acid Lime

Fruit storage in perforated polyethylene bag (700g) preserved the viability and vigour of seed intact upto three months under ambient temperature as well as at constant low temperature of 5°C. The seed quality attributes viz., viability and vigour were of high order in the seeds extracted from fruits under cold storage (6°C).

The fruits attained physiological maturity 150 days after anthesis with development of yellow patches on their light green rind. Seed weight, germination, length of root and shoot and vigour of seedling also attained the maximum at this stage.

Fresh seeds stored in moist peat moss kept in polyethylene containers (300 gauge) maintained the viability and vigour for six months.

Tree Crops

Conc. H_2SO_4 treatment with 800 ml of acid per kg of seed for 10 min for *A. auriculiformis*, 20 min for *L. leucocephala* and 30 mins for *P. iuliflora* recorded highest germination and vigour index values.

Seed development and maturation study carried out in *D. regia* revealed that the developing seed was visible on 49th day after anthesis and the seed reached maximum weight on 77th day after pollination. The seed did not germinate either during its development or after maturity.

Out of the three different poly pot sizes *viz.*, 16x8, 22x10 and 25x13cm that were compared, 25x13cm size was optimum for all the species except for *H.binata* for which both 25x13 cm and 22x10 cm size can be used.

Neem seeds from the completely ripened fruits were superior in seed quality in terms of germination percentage, seedling drymatter production and vigour index value. Seeds from the completely dried fruits recorded the least values for all the parameters studied.

Coffee

Ripe coffee berries of the cultivars selection 9 and selection 7 were collected from randomly selected plants from three tiers of the plant, namely, top 1/3, middle 1/3 and bottom 1/3. Seed recovery and seed quality evaluation revealed that higher recovery of seeds with higher 100 seed weight, germination, seedling growth and vigour index were recorded from the berries collected from bottom 1/3 portion of the plants in both the cultivars.

FOOD SCIENCE AND NUTRITION

Sago is currently prepared from fresh tapioca tubers. To assess the suitability of dried chips, tubers of varieties M. 4 and H. 165 were derinded, chipped, sun dried and milled. The flour yield was 86 80 and 80.48 per cent respectively. The starch was white. chemical analysis indicated that the starch and sago prepared from dried chips were within the limits of ISI specifications.

Trace mineral profile of 'sambars' and poriyals' due to utensils

Sambar and *poriyal* were prepared using potato, bhendi and drumstick leaves in aluminium, hindalium, stainless steel and cast iron vessels. After cooking, the trace minerals content (Fe, Zn, Al, Cu and Cr) was found to increase in both *sambar* and *poriyal*. Large increases in iron were observed in potato sambar cooked in low quality stainless steel vessel. The increase in the aluminium content was highly significant in poriyal when cooked in aluminium and hindalium vessels.

Pori and Aval preparation

Twenty-five varieties of paddy were studied. White Ponni, CO 43, Ponni, IR 50 and CO 41 yielded maximum volume of pori (560 to 630 cc). These five varieties were of medium

size and the 1000 grain weight ranged between 15 and 20 g.

Twenty-two varieties of paddy were tested for *aval* production. ACM 31 IR 20, Ponni, ADT 31 and ACM 25 yielded maximum *aval* of 73.42%, 70.88%, 73.42%, 71.82% and 70 96% respectively. White Ponni, ACM 9, ACM 18, ACM 8 and CO 43 had the highest acceptability scores ranging from 79.6% to 83.2%. The soaking time of *aval*, an important criterion ranged from five minutes to 29 minutes among varieties with white Ponni requiring only five minutes.

SERICULTURE

The effect of four antibiotics *viz*., penicillium, streptomycin, tetracyclin and chloramphanical individually and in combination on the economic characters of silk worm was studied. The larval weight was maximum (3.287 g) in penicillium 50 ppm + tetracyclin 50 ppm treatment. The cocoon weight was maximum (1.585 g) in penicillium 50 ppm + chloramphanical 25 ppm treatment.

The effect of amino acids *viz*., phenylalanine and alanine on economic character of L x NB_4D_2 worms was assessed. Treated leaves were supplied in six different patterns to the worms. The larval length and larval weight were maximum among the worms fed with 50 ppm level (phenylalanine) treated leaves once on 4th day in V stage. The cocoon weight, shell weight and silk were maximum in 50 ppm level when fed with treated leaves daily once on the worms during first four days in V stage. In the case of alanine the maximum cocoon weight (1 680 g) was obtained with worms fed with 50 ppm level treated leaves daily once on first four days in V stage. The shell weight, filament length and filament weight were maximum (268 mg) in the case of 50 ppm level treated leaves.

Four hybrids received from Mysore were evaluated. Shorter larval duration of 19 days was observed in PCN x NB_4D_2, as against 24 days in the rest. The maximum yield was recorded in the case of MY-1 x (NB_{18}xNB_7) at 57.75 kg/100 DFLS.

HORTICULTURE

POMOLOGY

Banana

Meristem Culture

At Thadiyankudisai, one sucker developed came to flowering eight months after planting. The bunch weighed 9.5 kg with 107 fingers. Each finger weighed 65 g. The fruits were subjected to organoeleptic test and found to be good, resembling 'Virupakshi'.

Crop Management

Nendran (AAB) banana responded positively to high level of P_2O_5 applied in three splits. A fertilizer dose of 150 g N, 90 g P_2O_5 and 300 g K_2O/plant applied during 3rd, 5th and 7th month increased the net income per hectare to Rs. 26905/ha with a benefit-cost ratio of 1.88.

Crop Protection

For the early detection of the bunchy top virus the leaf extracts from infected suckers could be treated with 5 ml of 10% sodium chloride solution

and kept overnight. Diseased ones turn turbid while the healthy ones remain clear.

Dipping banana hands in neem oil 1% emulsion, 10% thulasi leaf extract or 10% zimmu (onion x garlic) leaf extract enhanced storage life.

MANGO

Crop Protection

Two preharvest sprays of Dithane M 45 at 0.2% at fortnightly intervals and the third spray just a fortnight before the time of harvest gave effective control of both anthracnose and stalk-end-rotting during storage. The percentage of decay on storage was 14.5 in the sprayed lots as against 76.2 in the unsprayed lots.

Pre-treatment with 8% Frutox was effective to control the post-harvest decay of mango fruits under cool chamber storage conditions. This could bring down the physiological loss in weight and record highest number of fruits (46.7%) after two weeks of storage whereas all the untreated fruits were spoiled.

PAPAYA

Crop Protection

Among the nine fungicides tested, dipping matured CO 2 papaya fruits for 10 minutes in Topsin-M 0.1% solution and storing under room temperature recorded least infection and enhanced the storage life. This was followed by Bavitstin 0.1% and Benomyl 0.1%.

GRAPEVINE

Crop Protection

The incidence of downy mildew was scored at Paiyur in 17 varieties. Bangalore Blue was found to be moderately resistant while most of the rest were susceptible.

ACIDLIME

Crop Improvement

Acidlime Selections

Seven acidlime selections assembled at Periyakulam from Kadayam, C Pudur, Gudalur, Bodi, Sirumalai, Periya-Kulam and Thirukkurangudi were evaluated. The Kadayam selection exhibited better tree growth (2.9m height and 21.6 cm stem girth) and higher yield (1229 fruits/tree weighing 44.2 kg) than the others.

In a study to find out suitable root-stock, acidlime budded on Rough lemon recorded the maximum tree height (4.49 m) and girth (48.14 cm) followed by acidlime on Troyer citrange. A similar trend was observed in yield also.

MANDARIN ORANGE

Crop Improvement

In a trial with six rootstocks, rough lemon registered the highest fruit yield of 25.03 kg/tree followed by Trifoliate orange giving a yield of 23.16 kg/tree.

Crop Management

Application of 250-500-500 g of NPK/tree recorded the maximum yield of 473.53 fruits/tree weighing 49.95

kg followed by 250-250-500 g of NPK/ tree which yielded 382.13 fruits/tree weighing 38.59 kg per tree.

BER

Crop Protection

Dinocap spray (0.1%) three times at 15 days interval registered the least powdery mildew incidence followed by wettable sulphur 0.2% and bordeaux mixture. 1% spray.

GUAVA

Storage study with Lucknow 46 mature green guava fruits showed the beneficial effect of zero level ventilation in the retention of green colour irrespective of the gauge of poly bags. Storing in ventitated bags was only slightly better than the control. Prepacking brought down the weight loss from 17.9 to 0.1 per cent. The weight loss decreased with increase in poly bag thickness and decreased with increase in ventilation.

JACK

The non-edible portion in jack fruit was in the order of 55.9% of the whole fruit. The jack fruit waste was separated into perianth, central core and outer prickly rind and powdered. The powder obtained from fruit perigone was rich in organic acid (2.61%), reducing and total sugars (4.22% and 16.41% respectively) and water soluble protein 4.32%). The outer prickly rind waste meal was rich in alkali soluble protein (7.83%). The central core waste contained as much as 0.60% total phenolics.

OLERICULTURE

Tomato

Crop Improvement

Variety Released

Paiyur 1 Tomato : This is a hybrid derivative of cross between Pusa Ruby and CO 3 (Marutham). It had recorded an average fruit yield of 41.59 t/ha as compared to 32.84 t/ha by Pusa Ruby and 30.40 t/ha by PKM 1 recording 31.48% increased fruit yield over Pusa Ruby as rainfed crop and 28.49% as irrigated crop. It had low incidence of fruit borer. Tolerance to drought was another special virtue.

Crop Protection

Foliar application of 0.5% calcium chloride at 30th, 45th and 60th day after transplanting tomato (CO1 and CO3) seedlings reduced the fruit cracking from 40% to 35%. It also increased the firm-index of fruit from 51 - 61, ascorbic acid content from 24 to 26 mg/100 g and pectin content from 0.7% to 0.8%.

BRINJAL

Crop Improvement

Variety Released

CO 2 Brinjal : The selection SM 609 was released as CO 2 The plants were medium in height and spread, and capable of yielding as high as 38.00 t/ha. The fruits were oblong in shape having a dominant deep purple colour with intermittent pale green streaks of different lengths and widths. The crop duration was 150 days.

BHENDI

Crop Protection

Seed treatment with methomyl 0.04% plus one foliar spraying at the same concentration on 45th day after sowing minimised the population of leaf hopper, aphid, thrips, mite, whitefly and the incidence of yellow vein mosaic virus disease with a yield of 107.8 q/ha

BEANS

Crop Improvement

Variety Released

TKD 1 French Beans: This is a hybrid derivative from the cross Sel. 118 and suited for cultivation under partial shade as well as under open conditions on the hills. It gave 5.6t/ha of green pods in a crop duration of 90 days. The pods were flat, green, tender and stringless with good cooking quality.

POTATO

Crop Management

A survey conducted in 189 villages/hamlets and 597 holdings in tha Nilgiris showed that cyst nematode infestation was prevalent in all the three divisions of Kotagiri, Coonoor and Ooty with an infestation range of 60.4 to 76.3%.

GARLIC

Crop Management

In a fertilizer trial of garlic at Sheep Breeding Research Station, Sandynallah the treatment N 80, P 40 and K 40 kg/ha recorded a mean yield of 10.78 t/ha.

FLOWERS

Crop Improvement

Variety Released

CO 2 Mullai: The hybrid clone B7 evolved through a cross between Mutant (S_1) x Long Point (JAI) was released as CO 2 mullai This had a yield potential of 11, 198 kg of flowers per ha as compared to 8800 kg/ha in CO 1 mullai. The length of the corolla tube of CO 2 mullai was longer (1.70 cm) than in CO 1 mullai (1.50 cm). CO 2 mullai was free from phyllody disease and gall mite infestation.

CHRYSANTHEMUM

Crop Management

Among seasons, planting the propagules during June - July was found the best, followed by October-November planting. The suckers planted in sand during June - July gave hundred per cent rooting under intermittent mist.

SPICES AND PLANTATION CROPS

TURMERIC

Crop Management

A trial on levels and methods of application of potash at Bhavanisagar revealed that high dose of potash at 90 kg/ha in three splits registered maximum yield of fresh rhizomes (44350 kg/ha). This was due to high shoot - root ratio (1 00 : 6.87), more LAI (18.42) and more number of productive tillers (2.9).

COFFEE

Crop Improvement

Promising Cultures

Among the thirteen *C. arabica* selections, Selection 9 followed by Selection 10 and Selection 5 showed superiority in ripe berry yield over others. The mean yield of ripe berries per plant in these selections ranged from 4.78 kg to 6.53 kg. The weight of clean coffee was highest in Selection 9

CASHEW

Crop Improvement

Cashew Germplasm

Among the germplasm collections, the type M. 15/4 recorded the highest yield of 3.02 kg/tree followed by M. 11/2 and M. 18/3.

Crop Management

Softwood grafting with five day old seedling root stock recorded the highest mean establishment of 61.7% on 60th day among the different months between July '87 to November '87.

PALMYRAH

Crop Management

Seeds pre-treated with 100 ppm ethrel for three hours produced vigorous seedlings.

Palmyrah seedlings lifted for containerisation can be dipped for three hours in the solution containing DAP and KCl each at 2% with NAA at 25 ppm for increasing the rooting.

PEPPER

Crop Improvement

Promissing Cultures

Panniyur 1: At Thadiyankudisai the variety Panniyur-1 continued to give high yield recording 3.5 kg of pepper per standard followed by Kottanadan with 3.2 kg per standard.

Crop Management

A new method for rapid multiplication of pepper developed at CPCRI, Kasaragod was modified. The runners of pepper vines are planted in trenches and split bamboos of 1.5 m length (filled with moss) are placed close to the vines. The vines, as they grew are tied to the bamboo so as to bring every node in contact with the medium. Roots develop at every node. When the vines reach the top of the bamboo the tip is pinched off and the vine crushed at the 3rd node from the ground. After 10 days the vine is cut at the crushed point and removed from the bamboo and separated out into single nodes with roots. Each of this rooted node is planted in poly bags. When buds grow and produce 3-4 leaves, the cuttings are ready for planting and subsequently every three months. From every rooted cutting 40 cuttings can be taken in a year.

FENUGREEK

Crop Protection

Root rot incidence was reduced to 36.7% by drenching 0.1% carbendazim compared to 64.4% in control. This treatment increased the yield to 196 kg/ha against only 30 kg/ha in control.

The seed pelleting with the antagonistic fungi, viz., *Tricoderma viride*, and *T. harzianum* also reduced the disease.

FORESTRY

Species Evaluation for Different Tracts

The evaluation of species undertaken at Killikulam, Pudukottai and Mettupalayam indicated the following :

At Mettupalayam only exotics showed better growth. *Eucalyptus* continued to be one among the best few. Most of the rest were nodule fixing legumes of multipurpose trees.

Under the very dry conditions of Killikulam, species like *A. suma*, *A. ferruginea*, *Leucaena diversifolia* and *A mellifera* performed remarkably well both in height and diameter growth.

A. holosericea and *Caesalpinea eriostachys* were the most promising species at Pudukottai site *Acacia holosericea* nodulates naturally in the soil. Despite low survival, *Acacia crassicarpa* showed very high rate of height growth.

Influence of Tree Cover on Arables

In a seven year old *E. tereticornis* plantation, arable crops like sorghum, bajra, cowpea, lab-lab, blackgram, bhendi, sunflower and cotton raised as intercrops and control plots in the open revealed that there was a reduction of 29% in the height of arables under intercropping with trees. Pulses were least affected. With regard to yield of arables, minimum reduction was recorded in cereals (24%) followed by pulses (26%), cotton (30%), sunflower (36%) and vegetables (45%).

Allelopathic Effect of MPTS

Ten microplots of one m^2 each were randomly marked under four year old woodlots of *Eucalyptus tereticornis*, *Casuarinia equisetifolia* and *Leuceana leucocephala* with adequate control in the opens.

The mean light intensity was less under the canopy of all MPTS. The magnitude of reduction was more under *Leucaena* (50.5%) than under *Eucalyptus* (34.8%). The soil moisture depletion under *Eucalyptus* was comparatively fast being 13% at 35, 48 and 72 hr after saturation, with corresponding values for the other trees at 4% and 15% only. Pan evaporation was also high in *Eucalyptus*. The quantum of biomass reduction was less under *Casuarina* (73.9%) than under *Eucalyptus* (87.2%) and *Leucaena* (83.5%).

The floristic composition of understory was also richer in *Casuarina* (18) than in *Eucalyptus* (12) and *Leucaena* (5).

MICRO PROPAGATION

Cashew : Propagation of cashew *in vitro* was attempted using different media. Callus initiation was observed from different explants like shoot tip, leafbit, petiole stem sections and cotyledons. Axillary shoot growth from the modal section was promising. Root as well as shoot buds were obtained from the cotyledonary sections in LS medium.

Banana : Two diploids, viz., Matti and Tongat and two diploid hybrids viz. H. 59 and H. 82 were experimented for rapid multiplication *in vitro* using MS-semi-solid medium. Successful shoot

induction was obtained by the altering the hormonal combination suitably.

Cassava : Different explants like apical meristem, axillary buds, leaf bits and petioles were used in MS medium. Callus initiation was very quick and the proliferation was rapid in apical meristem followed by axillary shoots. Various auxins, viz , MA, 2-4-D and benzyladenine were used to proliferate the callus.

Tomato : Various explants like leaf bits, shoot tips and stem sections were in MS medium. Callus development was quicker in leaf bits than other explants. The callus, thus developed was sub-cultured at different hormonal combinations for inducing embryogenesis.

Orchids

Dendrobium sp : Using nodal sections as explants induction of multiple shoots was possible in this species. The formation of huge number of pro-embryoids was successfully obtained.

AGRICULTURAL ENGINEERING

Improved agricultural implements and tools were designed and developed for the benefit of farmers. A brief account of them is presented below :

Castor Sheller

This castor sheller consists of a trapezoidal feeding hopper, a shutter to regulate the feed rate and shelling discs made of wood fastened with 6 mm thick rubber sheet over the rubbing faces. The clearance between the discs can be adjusted. To clean the shelled kernals a blower is fitted The unit may be operated either manually or using power.

The salient features are :

	Power operated	Hand operated
Cost of the unit (Rs)	1900	800
Shelling capacity (kg of pods/hr)	163	53
Labour requirement for operation	One man	One man + one women
Shelling efficiency (%)	97.0	99.0
Cleaning efficiency (%)	91.0	NA
Breakage of kernal (%)	0.7	0.9
Cost of shelling (Rs./q of pods including cleaning)	9.0	22.50

Groundnut Decorticator for Shelling Castor

Feasibility trials on shelling castor, using groundnut decorticator revealed that after changing the sieve size the unit could also be used for shelling castor.

The unit consists of a main frame with a semi-circular oscillating sector

which consists of seven cast iron peg assemblies. The handle provided in the oscillating sector facilitates operation by hand The perforated sieve is replaceable and the clearance between the oscillating sector and concave is adjustable. The salient features are :

Cost of the unit	: Rs. 800
Shelling capacity	: 76 kg of pods/hr
Labour requirement	: 2 women
Shelling efficiency	: 95.5%
Breakage of kernal	: 1.0%
Cost of shelling	: Rs. 19/q of pods

A Low Draft Tractor Mounted Chisel Plough

The unit is light in weight with a 20 mm wide reversible, replaceable steel share point. It has low draft and can be easily pulled by all low HP range tractors. It breaks up the soil upto a depth of 40-50 cm and can be operated at a forward speed of 4 km/hr. It can cover an area of 0.80 ha in eight hours. The cost of the unit is Rs. 1000/-

The chisel plough is meant for breaking up the hard pan to enable easy infiltration of rainwater and also to aid ideal root development.

Tapioca Chipper

This machine consists of a feed hopper, chipping disc containing three knives. chips outlet and a 0.50 HP single phase electric motor. The feed hopper is provided with pipes of 25 to 80 mm diameter to facilitate slicing of tubers of varying diameters. The capacity of this unit is 250 kg per hour The cost of this unit including the electric motor is Rs 2000/-.

The special features of this unit are:

* No danger from the chipping knife to the person operating the machine
* Tubers of varying diameters can be sliced
* Chips of varying thickness can be obtained.
* Collection of chips is easy.

Basin Lister

a) Tracter drawn basin lister

The unit can perform ploughing and basin formation simultaneously. It consists of three trenchers. These trenchers are lifted at regular intervals by means of cams and cam followers. Two ground wheels of 62 cm dia are fitted for transmitting the rotary motion to the cam and easy turning at headlands. Each trencher frame along with trencher, roller and supporting arm is hinged independently to the cultivator frame through a mounting bar.

Cost of the unit :	Rs. 2500/-
Coverage :	4 ha / day of eight hours
Size of basin formed :	240 x 30 x 15 cm
Cost of operation :	Rs. 127/ha.
Advantage :	Better moisture storage during monsoon season

b) Hydraulic activated tractor drawn basin lister

The basin listing is done by lifting the mounted ridger through the hydraulic

control of the tractor at a regular interval A simple cam and follower assembly is used to tap motion from the R. H. rear tractor wheel. The cam rises and dwells so that control lever is moved to the "lift" and returned to the "down', positions.

* The unit is capable of forming basins of 3 m length at 0.6 m spacing.
* Any ordinary tractor mounted ridger can be used for listing operation with this unit.
* The unit is basically a simple attachment to the tractor costing Rs. 300/-
* The coverage at a tractor speed of 4 kmph is 0.125 ha/hr.
* The device needs no special maintenance since it involves only linkages.
* The device is simple and easy to mount and dismantle.

Infra-red seed/grain treating drum for insect control

This unit consists of an endless belt with pulleys, three infra-red lamps of 250 watts each, a feed hopper and an outlet. A hand wheel is provided to operate the belt. The lamps are positioned at equal distance.

In the case of pulse seeds, an exposure of 15 seconds proved to be the best as it did not affect the germination as well as seedling vigour.

An Electronic Metered Seed Planter

A seed meterieg attachment to tractor drawn cultivator has been developed. The dropping of seeds (timing) is controlled by an electronic device.

* It can cover 2 ha per day of eight hours.
* The metering is regular of perfect timing and is devoid of misses due to slip in the ground-wheel as encountered in conventional planters.
* The plant to plant spacing is easy to adjust by changing the timing.
* It can be used for small seeds like sorghum and cumbu.
* The approximate cost of the unit as an attachment to cultivator is Rs. 500/-

Pelltiser

A pelletiser has been developed for densification of biodigested slurry into balls (granules) The pelletiser consists of two units, viz, pellets extruder and gyrotary shaker. To enrich biodigested slurry rock phosphate is used with powdered coir waste. A mixture consisting of 50 g of rock phosphate, 150 g of coir waste and one kg of digested slurry can yield 1350 to 1400 granules. The enriched slurry is fed into the extruder and the feed material is extruded by a helical screw into thick noodles. The noodles are collected cut into pieces of one cm length and made spherical in a gyrotary shaker. The cost of the unit is approximately Rs 12,000/-

Puffing Machine for Sorghum

A batch type puffing machine was developed. This unit consists of a aluminium vessel, a hot plate fitted with electrical heating coils, a platform to hold the hot plate and vessel, a

thermostat, an electrically operated stirrer and a foot pedal for removing the vessel at the end of puffing. Thirty ml of edible oil (groundnut oil) is used as heating medium for each batch. The efficiency was found to be 75%. A batch of 100 g of sorghum can be puffed within two minutes. The cost of the machine is Rs 1,250/- and the cost of one pack of 55 g of puffed sorghum works out to Re. 1.00.

WATER TECHNOLOGY

Cycocel on Rice Yield

An experiment was conducted in IR 20 rice with four irrigation schedules and cycocel spraying at different stages at 2000 ppm. Irrigation schedule with 5 cm continuous ponding and the spraying of cycocel at 2000 ppm at active tillering stage registered significant increase in grain yield. Interaction effect was also significant. However, the effect was more marked at low moisture regime (saturation to 25% DASM). The cost of cycocel spray was about Rs. 350/ha.

Saline Water for Maize

Significant increase in grain yield was obtained under ridges and furrow and flat-bed furrow methods of irrigation (5156 kg/ha and 5082 kg/ha respectively as against 3666 kg/ha in the check basin) with the application of FYM @ 25 t/ha and $ZnSO_4$ at 25 kg/ha and 25% extra dose of nitrogen. This traatment combination also reduced the concentration of toxic constituents like HCO_3 and Na in the soil.

Water use efficiency (WUE) was maximum for the combination of 20 m furrow length and discharge rate of 10 lit/sec (10.24 kg/ha mm). Maximum application efficiency and minimum water consumption were obtained with the combination of 10 m furrow and discharge rate of 10 lit/sec.

Irrigation Schedules and P for Blackgram

Studies on blackgram (T9) under different phosphorus levels and with different irrigation schedules indicated significant response to 'P' application and irrigation at Thanjavur. Application of 64 kg P_2O_5/ha was economical. The interaction effect of 'P' level with irrigation was significant. Irrigation at sowing and on 15 and 30 DAS with a 'P' level of 64 kg/ha was the best.

N and Irrigation Schedules for Gingelly

Studies on rice fallow gingelly in Thanjavur with different 'N' levels and irrigation schedules indicated significant response to both. Irrigation at sowing and on 20 and 40 DAS was the best.

Production Function Studies on Crops

Production function experiments were carried out on maize, ragi and cumbu adopting different moisture regimes and nitrogen levels. Various parameters like leaf water potential, transpiration rate, leaf diffusive resistance, leaf temperature, canopy temperature and canopy-air temperature difference were determined in addition to grain and straw yields of the crop. The results indicated significant interaction between moisture regimes and nitrogen levels for maize, ragi and cumbu enabling setting up of production function equations. There were also significant

correlations between grain yields and stress indices.

Seepage Losses in Rice Terraces

Whenever there is level difference between adjacent rice terraces the lower terraces gains some water from upper terraces through seepage rendering the pattern of water consumption different for the fields at various levels. At Agricultural College and Research Institute, Madurai there was a reduction of 5 cm in water consumption when there was a fall of one m in the level of the terrace. The water consumption for fields at the highest and lowest levels differed by 30 to 40 cm when there was an elevation difference of 68 m. The water requirement was governed by the following equation.

$$Y = 49.5 + 4.88 X$$

Where, Y - water requirement in cm X - level of the terracc in m (taking valley bottom as zero).

Sprinkler and Surface Irrigation in Groundnut

Comparison of sprinkler method of irrigation (3 cm depth of water at IW/CPE ratio of 0.75) with conventional flow irrigation (5 cm at IW/CPE ratio of 0.75) at Madurai indicated that sprinkler irrigation for groundnut resulted in increased pod yield over conventional method of irrigation with a water saving of 17 to 48%

Soil Moisture Depletion Under Forest Trees

Moisture depletion pattern was estimated for soil profile depth of 1.20m using Neutron probe moisture meter under *Eucalyptus*, *Casuarina* and bare lands. The data indicated that the moisture depletion was more under *Eucalyptus* (2.60 mm/day) than under *Casuarina* (2.02 mm / day) and land surface (1.73 mm/day).

Low-cost Water Storage Structure

Three types of storage tanks of 50 m^3 capacity with dimension of 7.6 x 7.6 m at the top and 6.0 x 6.0 m at the bottom with 1.5 m depth were constructed viz., earthern tank, tank made up of pre-cast structure with 30.0x 30.0x 7.5 cm of cement concrete slabs and cement concrete tank. The cost of construction was minimum (Rs. 950/-) for the earthern tank. The costs for the other two structures were Rs. 4560 and Rs. 4230 respectively.

Seepage loss was minimum (1.68 cm/hr) with inner lining of black alkathene sheet. The cost of black alkathene sheet for one tank worked out to Rs. 272/- and was likely to sustain for a period of 12 months under continuous use.

AGRICULTURAL AND RURAL DEVELOPMENT STUDIES

Techno Economic Survey

A techno-economic survey in Periyar and the Nilgiris districts revealed that in Periyar district about 65 per cent of the work force was engaged in agriculture and 40 per cent of the population was literate. Trade, agriculture, miscellaneous and textile industries had high weighted output multipliers. In the Nilgiris district the population increased by 27 per cent in 1981 as compared to 1971. The literacy rate was 56.52 per

cent Agriculture, trade, food, miscellaneous and metal industries had high weighted output multipliers.

Impact of Drought in Coimbatore District

The Study revealed a fall of 37 per cent in labour mandays in agricultural labour households due to drought with 8.31 to 33.54% loss of income among various categories. Assets were liquidated to the extent of 33 per cent Sugarcane, cotton and paddy were substituted with less water demanding crops like sorghum and groundnut.

The loss in average income per household was estimated at Rs. 2801 to Rs. 10899. Purchase of low priced food-grains, taking less nutritive meals, resorting to fuel wood collection, building construction works and borrowing were some of the crisis management strategies followed.

Response to Modern Implements and Tools

The extent of awareness and adoption of new equipments among farmers was studied with 400 farmers in 80 villages in eight districts.

The coverage of implements was not comprehensive. The farmers' response and the rate of adoption were high in the case of implements like iron plough and sprayers, which were useful to complete the operations in time. Other implements such as bund former and seed-cum-fertilizer drill required more efforts to convince non users The most important reason for the non-adoption was the high cost of implements and lack of after - sale - services.

An Economic Appraisal of Duck Rearing

The study covered hatching units, pullet raising units and layer units as individual entities Among the cost components to hatch 100 eggs, cost of hatching eggs ranked first (49 per cent) followed by the cost of broody hen, labour cost, feed cost and depreciation on equipments Net return worked out to Rs. 77 to Rs. 82 per 100 eggs and Rs. 1.05 to Rs. 1.14 per duckling. The net return per rupee invested was in the range of Re. 0.43 to Re. 0.40. In pullet rearing, the fixed cost component was more than the variable cost. Depreciation on male ducks was higher than others. The net return was Rs 162.25 to 349.87 per 100 straight line ducklings The net return per rupee invested was Re. 0.09 to 0.24. In layer rearing also the fixed cost component was found high. The net return per rupee of investment worked out to Re. 0.15 to 0.21.

Training Needs for Farm Women

A study to assess the training methods for educating women in agriculture showed that most of the respondents (70.00 per cent) of Thanjavur and Pudukottai districts preferred all the training methods viz, lecture, discussion, demonstration, teaching aids, field trips, exhibition, slide and film shows and talk by experienced farmers. The respondent of Chingleput district preferred only two methods namely, exhibition and slide / film show. Field trip was preferred by respondents of South Arcot district.

Innovational Acceptance

Adoption of cent nursery, manual hand weeding and water management

(5 cm) was followed by all the repondents. Recommended seed rate was the next practice followed by practically all. The other practices adopted by a higher section of respondents were di-ammonium phosphate application to nursery (74.66%), plant protection schedule (62.66%) and spacing (50.66) The important recommended practices left unadopted were post-harvest technology (72.00%), herbicide use (68.60%) and top dressing (60.00%). Desirable consequences like increased yield and income were observed among most of the respondents.

Mass Media as Complementary to Direct Training

A study compared the effectiveness of selected extension methods on *Azospirillum* treatment and whitefly control. Frequent contact with extension agency, rare radio listening and least participation in social organisation were observed among the respondents. Half of them were not aware of the existence of contact farmers. Audio-cassette with feed back produced a high amount of learning effectiveness at cumulative level for *Azospirillum* treatment (0.703) and for whitefly control (0.631) in cotton. The average score also indicated that the method of whitefly control in cotton was effectively learnt (0.405).

The cost effectiveness ratio indicated that for an investment of Rs. 621 in Krishi Vigyan Kendra's regular programme for one day, the output was 0.483 units in terms of learning effectivenes whereas the same was 0.545 (cumulative) and 0.698 (technology wise) units in the case of audio-cassette treatments with an investment of Rs. 143.00 only.

Study on Use of Saline Irrigation Water

The awareness level in the use of saline water and the constraints in the use were assessed in a sample of 150 respondents

The awareness on soil test, water test and soil reclamation was low among the respondents. The awareness on using saline water for agriculture was moderate. Stunted growth, mortality of crop, drying of leaves, root decay, salt encrustation in the soil and low yield were experienced by farmers using saline water for irrigation.

The methods used to overcome the problems were ponding rain water, application of coir pith, green leaves and farm yard manure, raising salt tolerant varieties and irrigating the crop with good water in early phase and using saline water in later stages.

Production Constraints in Sugarcane

The study was taken up in Dharmapuri and Salem districts. Only one-third of the growers raised COC 671 despite the insistance of the sugar factories. Lodging, poor tonnage, susceptibility to drought, more damage due to animals and pests, arrowing and poor tillering were the constraints in raising COC 671. Three-fourths (77.50%) did not adopt sett treatment owing to the perceived constraints. Majority did not adopt basal application of P due to delayed supply of fertilizers from factory, heavy organic manuring to preceding crops and lack of conviction of the practice. Nitrogenous fertilizer was

applied below the recommended dose by 34.34 per cent. It was 73.33% of the recommendod level for potash, while P_2O_5 was applied above the recommended level. Herbicide was not applied by 89.17% for want of experience, fear on germination, want of time etc. Use of hatchet was not in practice for harvest due to lack of awareness. Credibility of information source was with sugar mill staff, T & V staff, print media, farmers and radio in that order.

Blue Green Algae for Paddy

The extent of application of blue green algae in paddy cultivation and constraints in adoption were studied in Thanjavur district. Majority (57%) of the respondents applied BGA for the past two years. Nearly all (91%) adopted 10-12.5 kg/ha with an expenditure of Rs. 15 to 25 per ha. Nearly 42 per cent got additional yields upto 250 kg of paddy/ha valued at Rs. 450/- while one fifth (16.4%) got additional yields upto 500 kg/ha valued at Rs. 900/-. One third of them economised application of nitrogenous fertilizers worth of Rs. 50-300/ha. Some farmers (17 per cent) felt that BGA improved the soil with no marked increase in paddy yield

All India Co-ordinated Project on Scheduled Caste Area Research

The project aims to improve agriculture, and allied fields for the advancement of scheduled castes. It was found from the 100 half-acre technology transfer plots that addition of organic matter was essential to get estimated yield from CO 26 cholam under dry farming system.

Even in low fertility status soil, scheduled caste farmers were able to reap 750 kg of IR 20 paddy grain from half an acre plots when they followed all the recommended technologies. Semi-literate SC women were able to absorb the skill in tailoring very quickly and each trainee had earned about Rs. 10-12/day as wages. They were able to stitch 50 pairs of school uniforms in a week and earned Rs. 190 to 275/- from the social welfare department.

Mushroom production became an accepted technology among SC families. According to their need they were able to produce mushroom for consumption and sales.

VETERINARY AND ANIMAL SCIENCES

I. ANIMAL PRODUCTION

(a) Animal Protein

The animal genetics discipline of Veterinary College, Madras has studied the chromosomal defects in cattle by using a suitable media for tissue culture. Karyological studies in buffalo population revealed the relationship of chromosome aberrations with infertility and helped in the detection of pathological conditions like leukaemia. The research also established the characteristics of Toda buffalo chromosomes on par with international nomenclature for the first time with a view to incorporate the carcass value and good economic traits Toda buffaloes with other breeds of buffaloes.

Studies on bio-chemical polymorphism in rabbits have helped in improving the survival rate of litters utilising

the low alkaline phosphatase level as a gene marker. Thay have also helped in better selection and improvement of animal protein production traits.

The Mecheri x Dorset quarter bred progeny had better birth weight and growth rate than the pure bred Mecheri sheep leading to better mutton production in quality and quantity. The results of research on the use of different chemicals on the tenderising effect of mutton revealed that magnesium chloride at 0.12 M concentration had a high tenderising effect. This fact can be profitably utilised in meat industry.

(b) Milk Protein

In order to conserve the milk protein available in the dairy cattle for a longer poried elaborate studies were done to increase the keeping quality of raw milk at room temperature which is available for transfer to the field. Steam sterilisation of milk cans was found to be superior to chlorine washing at 200 ppm.

(c) Other Meat Protein and Animal Bye-Products

To aid selection pragramme, heritability estimates $\pm$ SE of 0.1659 $\pm$ 0.0290 were obtained for number born alive and 0.1255 $\pm$ 0.2980 for number weaned were obtained. The repeatability of all the three litter traits was low (0.1292 $\pm$ 0.436, 0.0707 $\pm$ 0.3022 and 0.0631 $\pm$ 0.2202) for the total number of piglets born, number born alive and number weaned respectively

Research on animal agricultural wastes revealed that the slime could be converted into a meal of high nutritive value and used as a feed supplement for livestock. The sheep and goat intestines after processing yielded cat-gut of a high strength.

II. FORAGE AND ANIMAL FEED

A cost effective forage and feed ration for animals is envisaged to bring about better animal production. Research on animal nutrition feeding trials revealed that subabul leaf meal could be included upto 25% level in the concentrate mixture along with paddy straw feeding for growing heifer calves for good growth. Treatment of rain tree fruit with water, lime and sodium hydroxide did not have any effect on weight gain in sheep. The treatment, however, reduced the tannin content.

A cattle lick with rice bran, molasses, urea, mineral mixture and salt has been developed to increase the nutritive value of cellulosic waste. The cost of the lick works out to Rs. 5.00 per lick and lasts for 10 days per animal.

Enriched paddy straw can sustain the growth of young bullocks doing medium draught work. The enriched paddy straw can replace the concentrate feed to control group at the level of 0.5 to 1.5 kg

Compounded feed and cage rearing improved the egg production and feed efficiency over farm mixed feed and deep litter system of rearing.

In a trial carried out on effect of feeding different vegetable proteins on broiler performance it was found that soyabean oil cake and combination of different oil cakes gave good performance.

III. ANIMAL HEALTH

Survey taken in the field showed that among breeds of cattle Sindhi calves recorded highest mortality and Tharparker calves showed the lowest. More number of male calves died than the female calves in both cattle and buffaloes

Ultra structural studies on rhinosporidiosis in man and animals were done in Kanyakumari district which is highly infected. The epidemiological relationship between animals and man was established.

Studies on bobbles and their impact on skin damage were carried out. The results so far indicated that *Demodex bovis* was primarily responsible to cause skin damage and causing economic losses. This work is in the first phase and is being confirmed.

Among poultry colibacillocis, non-specific enteritis and yolk sac infection were the major problems encountered in the areas of Poultry Development Centres of Tamil Nadu Agricultural University, which warrants careful management practices. Farmers were given adequate scientific advice on water sanitation and the use of proper antibiotics to manage these problems.

In order to tackle the menacing outbreaks of ranikhet disease, poultry farmers were advised to carry out wing-web vaccination of their layer flocks during the peak production thus reducing the severity of the disease without affecting the laying porformances.

An innovative pullet vaccine to protect against ranikhet disease of poultry has been developed for the first time in the country. This would obviate the cumbersome process of handling the chicks during vaccination. The immunogenic parameters under laboratory condition have been studied and found to be very efficaceous.

For the first time in Tamil Nadu, mapping of the acarids with identification affacting the livestock and poultry has been documented completely. A detailed survey on the incidence and the endemicity of the various arthropods affecting livestock was carried out in terms of phylageny. Further, the efficacy of the insecticides against these arthropods has also been studied.

IV. VETERINARY CLINICS

Studies on the use of synthetic atropine sulphate as antidote in organo phosphorus pesticides poisoning was carried out. It was found that propanthalone can be effectively used in such cases.

Malathion 50 EC was found to be the drug of choice for eradicating ticks from livestock.

Brucella canis infection in dogs was scientifically established and identified and its immune parameters have been studied.

The immunogenicity of anti-rabies vaccine by direct challenge with street virus was studied. The results indicated that the presently available vaccine can protect dogs for one year and the work has received the appreciation of World Health Organisation.

A study using bovine and avian PPD in detection of tuberculosis in bovines was conducted and the results obtained were promising.

FISHERY SCIENCE

Culture of brine shrimp, *Artemia salina*

Mass culture experiments carried out in the circular cement tanks proved successful. The salinity was maintained at 60 ppt and the temperature varied from 28°C to 30°C. *Chlamydomanas* sp. was found to be the preferential food item of the animals cultured.

Mariculture of fishes

The growth study of the prawns in the cage conditions revealed growth to the extent of 18.3 g and 25.8 g in the second and third months respectively. The survival rate was 39%.

Pollution monitoring studies in Tuticorin water

Extensive damage to the mangrove vegetation due to the settling of fly-ash has been observed near the Thermal Power Station bridge. Sampling for benthic organisms in the adjoining area revealed complete denudation of burrowing forms. Oysters in the area showed less meat. Terrestrial and semi-terrestrial crabs have dwindled in number. The impact on the post-larvae of prawns could not be assessed immediately. However, fishes were observed to be normal and healthy.

Brackish water pen culture

An experiment on supplemental feeding of white prawn *Penaeus indicus* in two layered nylon net pens of 15m² size and stocked at 25 nos/m² indicated growth of 5.37 g to 7.45 g in first pen (natural feeding)and from 5.37g to 8.86 g in the second pen (with supplements). The survival rates were 49% and 65% respectively.

Polyculture of fin fishes and shell fishes in brackish water

The hydrobiological parameters in the brackish waters showed that the water temperature varied from 28.5 to 32.2°C; pH from 8.1 to 8.3; dissolved oxygen from 3.8 to 5.2 ppm; salinity with a maximum of 36.5‰ and turbidity from 19.2 to 20.6 cm.

The polyculture experiments conducted in an earthen pond of 2.25 m² area showed that the carangids attained a maximum growth of 18.3 cm, milk fish 16.2 cm and *Etroplus suratensis*, 13.6 cm.

Nutrient chemistry and proper utility of sewages

Water and sediment samples were collected from the northern and southern localities of Tuticorin at sewage discharge and sewage-sea mixing sites and their nutrient chemistry was studied. The dissolved oxygen and salinity values were generally poor in the sewage discharging areas, owing to high H_2S, COD and organic matter. The COD values of northern locality were invariebly more (8-12 mg/l) than the southern locality (6.4-7.4 mg/l).

Operational research project in fish culture, Killikulam

The average growth of catla, rohu, mirgal, common carp, silver carp and

grass carp in a period of 126 days (at the time of harvest) was 363.3 ± 39.8, 258.8 ± 17.1, 161.7 ± 25.3, 244.4 ± 11.0, 472.8 ± 45.0 and 208.5 ± 69.1 g respectively. The rate of growth of the carp fishes in the tank was observed to be 2.9, 1.9, 1.2, 2.6, 3.7 and 6.4 g/day/fish respectively. The silver carp attained the optimum size and it showed flesh growth of 3.7 g/day/fish.

Preparation of certain smoke cured fishes

i) The smoked and dried eel had 70-75% Protein, 11-15% fat, 6-10% moisture and peroxide value of 3-10 milliequivalents/g of fat.

ii) The smoked and dried sardines had moisture 12 to 14%, protein 65 to 70%, fat 2 to 3% peroxide value 25-30 milliequivalent/g of fat; TMA 25 mg%; TVB 325 mg% and total phenol content 8-12 mg%.

iii) The smoked and cured tuna had protein 73 - 78%, fat 0.95 to 1.5%, moisture 10 to 16% and peroxide value 25-30 milliequivalents/g of fat.

Biology of the thread fin breams, *Nemipterus spp.*

The seasonal occurrence of the thread-fin breams studied revealed that *Nemipterus bleekeri* was the most abundant and a top carnivore feeding on fish and shell fish. The length frequecy distribution was from 3.5 cm to 26.3 cm with 150.0 g. of body weight.

Chank fisheries and chank divers

Chank collection efficiency of the present season was higher than in the previous years, with the percentage of the FS chanks a little lower (75.81%). Normally fishermen have many children and spend the entire money without savings. When compared with them the chank divers earn substantially.

Duck-cum-fish culture

Fifteen 8-month old ducklings were stocked in a fish pond of 0.10 ha area. The pond reared fishes recorded an average increment of 380 g, and ducks to a range of 1.0 to 1.3 kg in a period of six months.

Supplementary feeds on the growth of carps

The ponds were stocked with the fingerlings of silver carp, catla, rohu, mirgal, grass carp and common carp at 4 : 1 : 2 : 2 : 1 : 2 ratio and at a stocking density of 6000 Nos/ha. The fishes fed with gingelly oil cake and rice bran had a maximum growth of 300 g (silver carp), 200 g (grass carp) 220 g (catla), 410 g (rohu), 200 g (mirgal), and 70 g (common carp) respectively.

Hormones on the growth and maturity of ornamental fishes

The fishes fed with the hormone-incorporated feed showed 44.0 to 48.1% increased feeding rate (P = 0.01) over the control. The hormone treated fishes also exhibited 100% more food conversion (P = 0.01). Methyl testosterone (MT) enhanced growth by 60.7 86.8% in platy and by 78.6-89.1% in molly suggesting a positive effect of MT treatment on feed utilization or appetite and growth promotion.

Productivity studies in Tuticorin waters

The rate of primary production was always found to be above 115 mgm-C/ cm^3/h. in a shallow region bordered by stunted mangroves in the coastal waters of Tuticorin. The minimum value of production was observed during the monsoon season and the highest positive value was noted during March.

Status of marine fisheries in Kanyakumari district

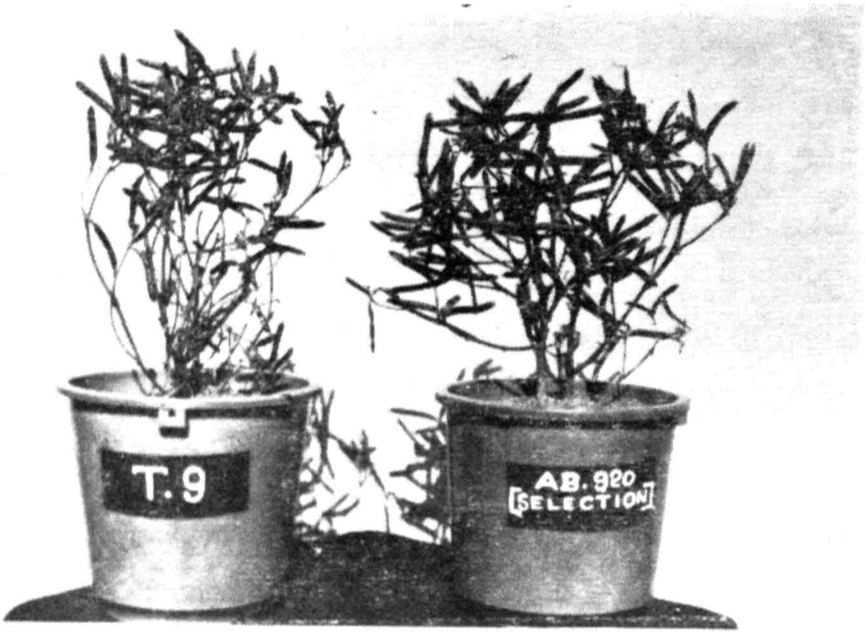
The net returns per fishing trip from mechanised boats were much higher than the net returns per fishing trip from traditional fishing crafts. The percentage of net returns to total returns was 11.87 for motorised *vallams* and 14.42 for mechanised boats and 25.82 for vallams and 41.60 for catamarans.

Adoption behaviour of Fishermen and trawler owners

The adoption behaviour of traditional fishermen revealed that the respondents were aware of almost all the innovation referrants except copper chrome arsenic compound/creoste. The trawler owners were aware of innovation referrants like the use of the following:-

i) cheaper wood materials, II) aluminium sheathing, iii) correct type of fasteners/tacks for sheathing, iv) recommended painting schedule, v) appropriate engine HP and vi) ice on board.

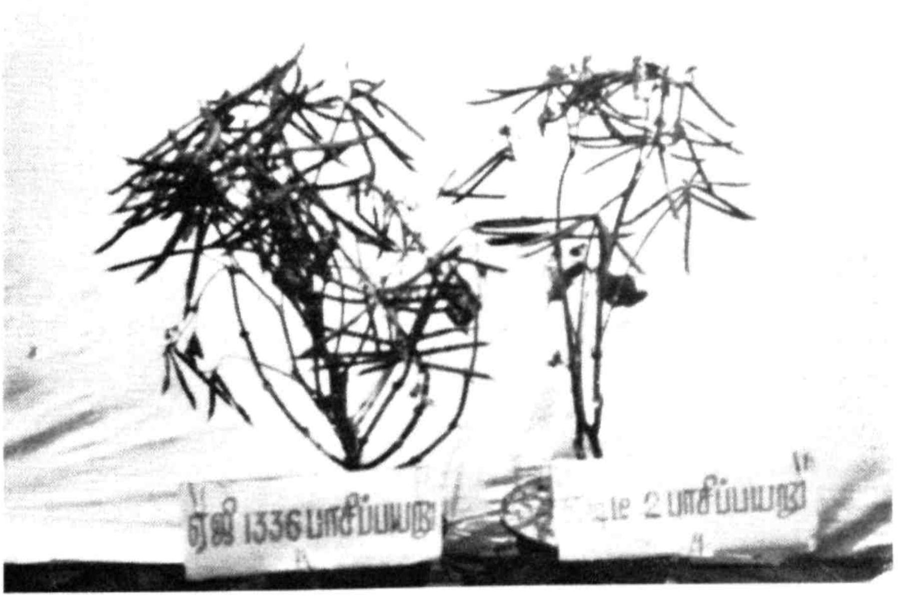
Ragi - CO 13



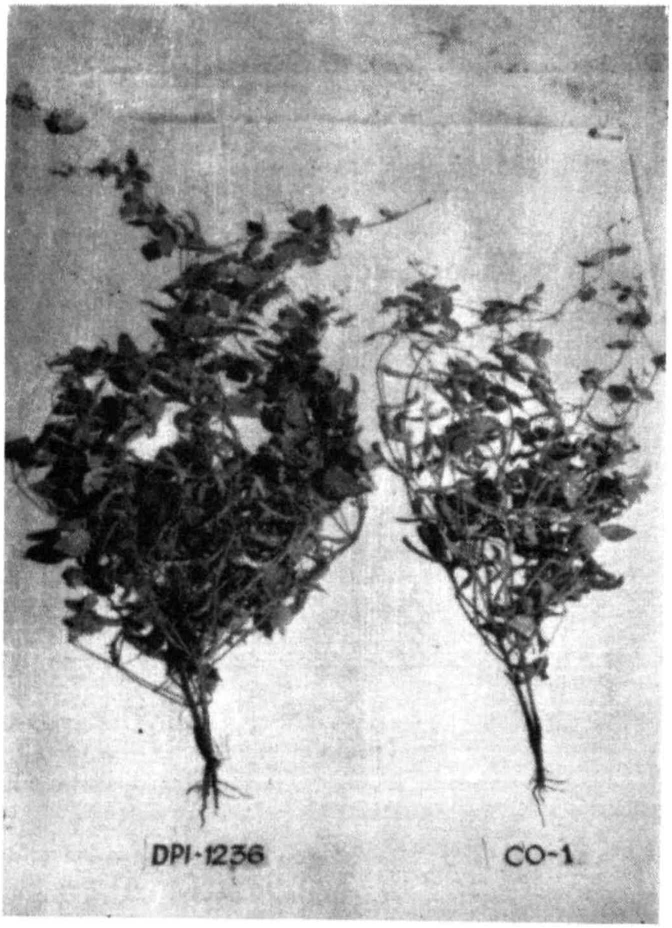
Blackgram - ADT 5

Blackgram - ADT 5

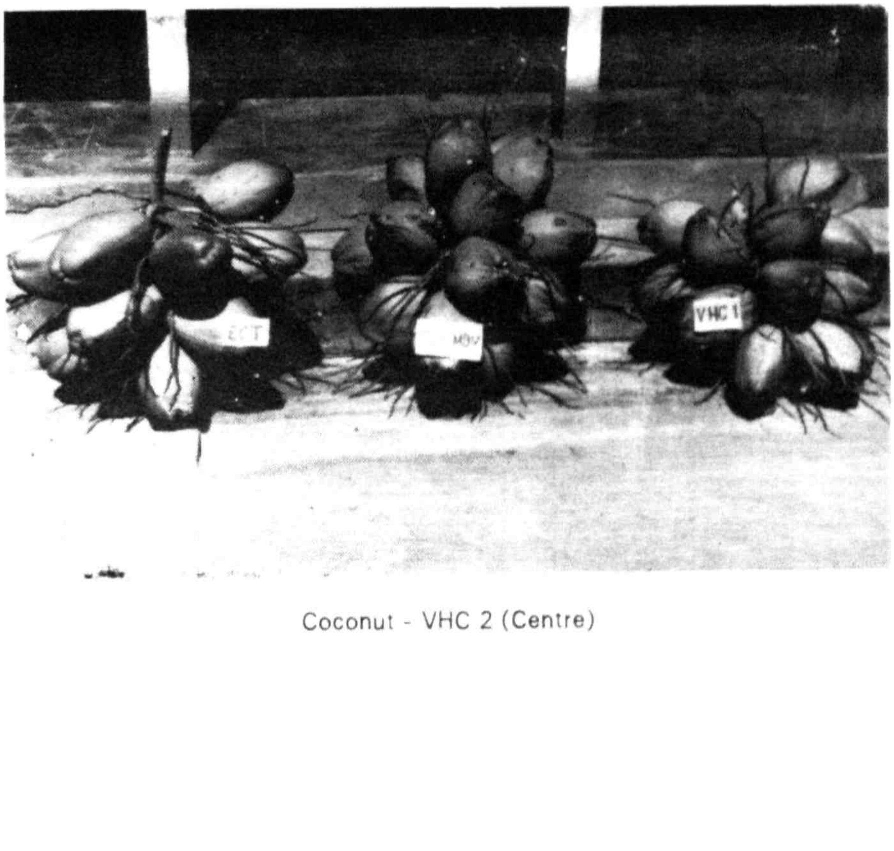
Greengram - ADT 3



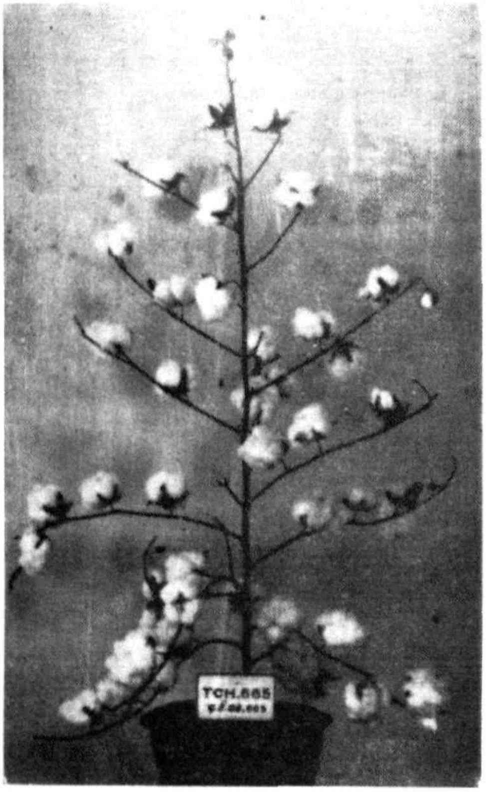
Greengram - ADT 3



Horsegram - Paiyur 1



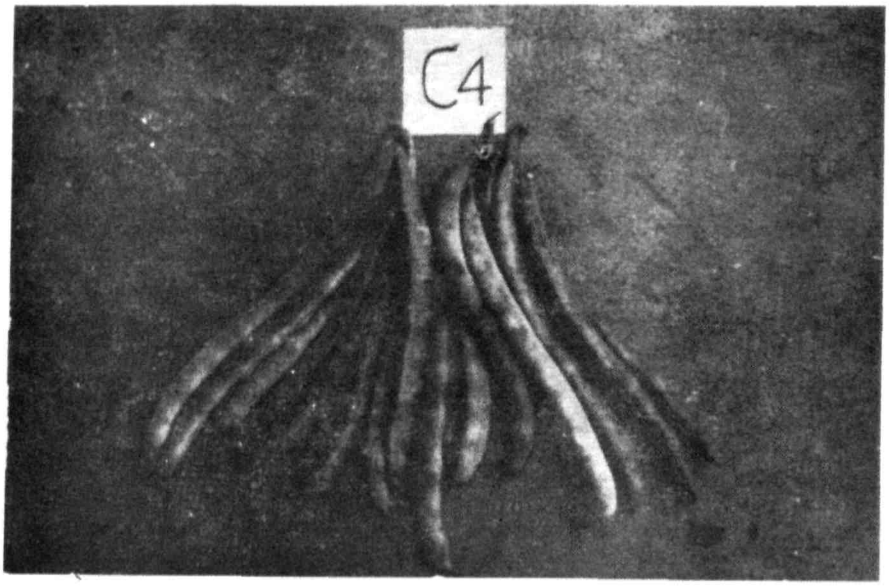
Coconut - VHC 2 (Centre)



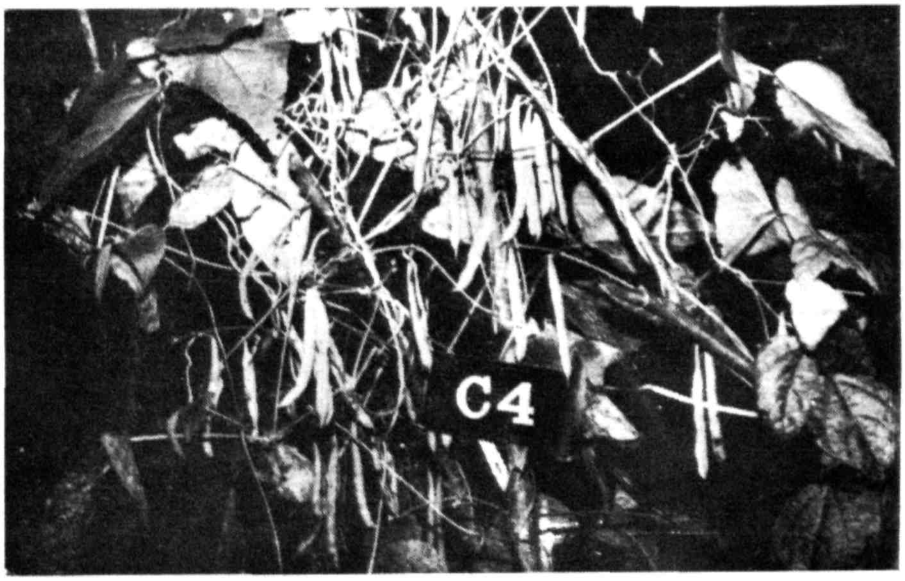
Cotton - MCU 11

Brinjal - CO 2

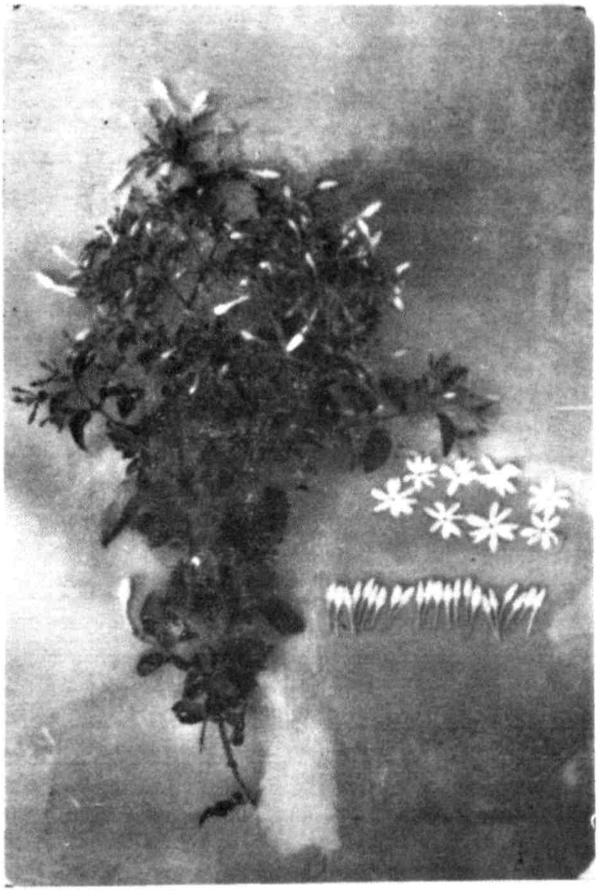
Tomato - Paiyur 1



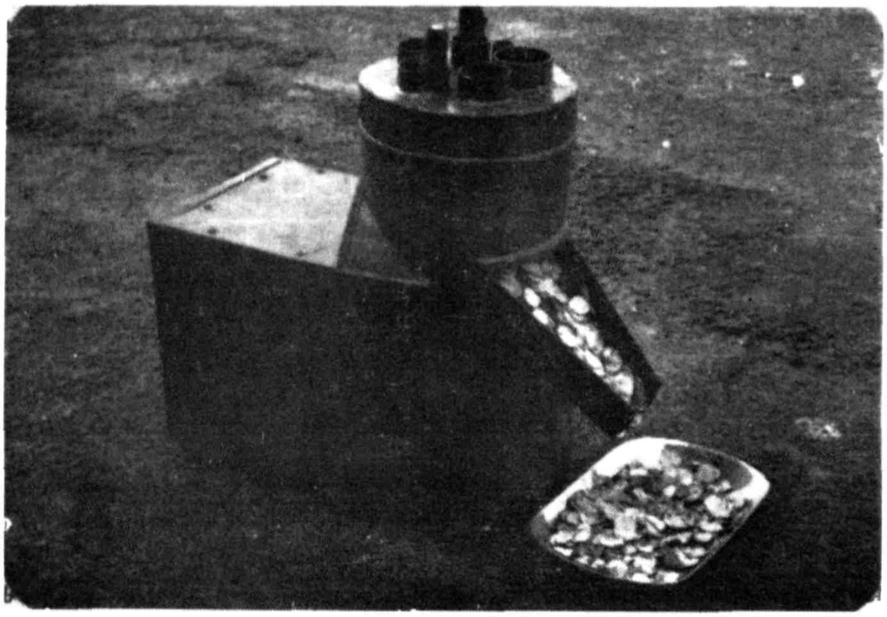
Beans - TKD 1



Beans - TKD 1

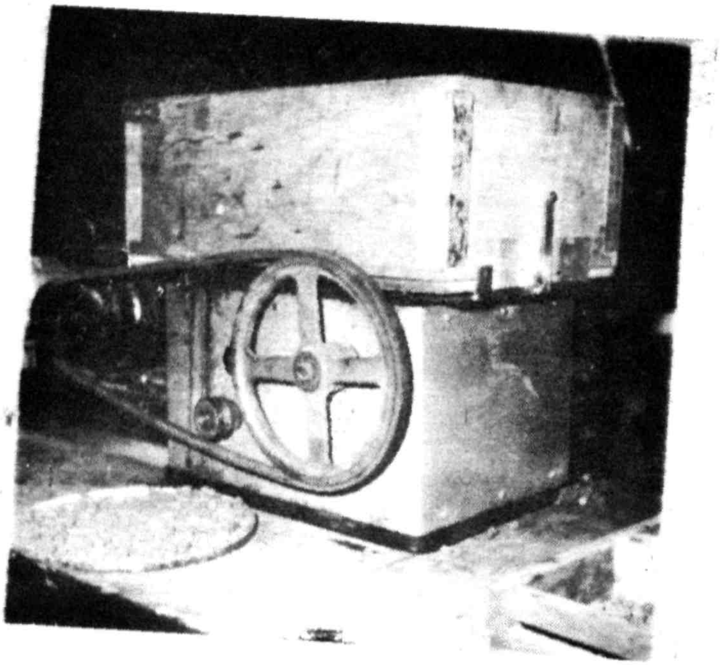


Mullai - CO 2

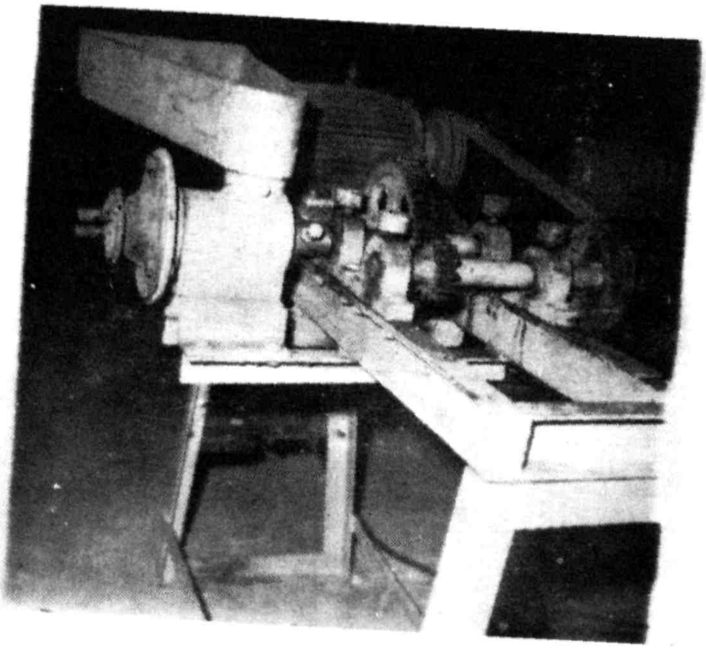


Tapioca Chipper

Sorghum Puffing Machine



Gyrotory Shaker



Pelletiser

5. EXTENSION EDUCATION

One of the important functions of the Directorate of Extension Education is disseminating the latest technologies to the farming community. The various extension strategies adopted by its key centres during 1987-88 are given below.

Krishi Vigyan Kendras

The six Krishi Vigyan Kendras at Coimbatore, Madurai, Pondicherry, Trichy, Vridhachalam and Kattupakkam conducted on-campus and off-campus training programmes on agriculture and allied activities. A total of 501 training programmes was conducted and the beneficiaries included 13869 farmers, 2297 farm women, 2927 extension workers, 1112 students and 536 other categories of personnel. In addition, these centres carried out 386 demonstrations, four compact block demonstrations, 61 group / village meetings, 23 farm/field days/visits, four farmers' days, 235 farm advisory services and answered 477 farmers' queries. Besides, 59 articles were published in dailies/farm magazines, 45 radio programmes/announcements were broadcast, seven TV programmes were telecast, 33 publications were brought out and 33 slide/film shows, 55 exhibitions and six campaigns were organised as part of their mass media utilisation activity.

Plant Clinic Centres

The staff of the five Plant Clinic Centres at Vellore, Tirunelveli, Tirur, Salem and Srivilliputhur periodically visited the farmers' holdings, identified pest and disease problems and suggested suitable remedial measures. These clinics also conducted on-farm testing of pre-release cultures of various crops, management practices and plant protection methods besides undertaking surveillance work for the purpose of forecasting the outbreak of pests and diseases.

The Plant Clinic Centres carried out 117 trainings. The beneficiaries included 1081 farmers, 330 farm women, 2173 extension workers, 27 students and 25 other categories of personnel. With respect to individual and group contacts, 74 demonstrations, 106 group/village meetings, four farm / field days/visits and four farmers' days were organised. Other major achievements comprised 1292 farm advisory services and answering 370 farmers' queries. To supplement their extension activities publishing of 33 articles in dailies and farm magazines, 50 radio broadcasts, 21 publications, 11 slide/film shows and two exhibitions were undertaken.

Poultry Research and Development Centres

The Poultry Research and Development Centres at Madurai, Namakkal, Pudukkottai, Tiruppur and Rajapalayam undertook three training programmes (benefiting 113 farmers and 50 students),

six demonstrations, 11 village/group meetings, 1955 farm advisory services and answared 5050 farmers' queries. In addition, these centres published 32 articles in dailies/farm magazines, organised 14 radio programmes, Telecast one TV programme, three slide/film shows, one exhibition and also published six extension literatures. The Poultry Research and Development centres conducted 5014 postmortems, examined 1661 specimens, carried out 159755 vaccinations, analysed 147 feed samples and started 73 new poultry units.

Livestock Research and Development Centres

The Livestock Research and Development Centres functioning at Erode, Nagercoil, Thanjavur, Tirunelveli and Dharmapuri conducted five training programmes (benefiting 106 farmers), 63 demonstrations, 17 village / group meetings, rendered 312 farm advisory services and answered 2794 farmers, queries. Besides, these centres published 10 articles in dailies / farm magazines, broadcast six radio programmes, brought out one publication, organised one exhibition and nine campaigns. Tney also examined 8203 clinical materials, conducted 211 postmortems, analysed 18 feed samples, carried out 68 minor and 24 major operations during the year.

National Demonstration Scheme

The ICAR sponsored scheme at Salem during 1987-88 organised 61 training programmes for the benefit of 541 farmers, 16 extension workers and 14 students. It carried out 285 demonstrations, five village/group meetings, 57 farm/field days/visits besides publication of six articles in dailies/farm magazines, 10 radio programmes and one extension literature. Under this scheme, 29 one-acre rainfed demonstrations and one on problem soil reclamation were laid out. The scientists collaborated with the Department of Oilseeds in laying out four compact block demonstrations at Thumbipodi, Vellaimanaickenpalayam, Singalanthapuram and Cholasiramani.

All India Coordinated Project on Scheduled Caste Area Research

The all India Coordinated Project on Scheduled Caste Area Research was functioning at Aruppukkottai. The project aims at improving the socio-economic conditions of the scheduled caste people. In this line of approach 28 training programmes benefiting 410 farmers and 93 farm women were conducted. In addition, 11 demonstrations, one farmers' day, three radio programmes and 10 exhibitions were conducted.

Communication Centres

The Communication Centres at Coimbatore and Madras disseminated the innovations of the University by conducting five training programmes, one farmers' day and answering 911 farmers' queries Under mass media utilisation strategies, 121 articles were published in dailies / farm magazines, 147 radio programmes were broadcast, 76 TV programmes were telecast and 11 exhibitions were conducted.

Lab-to-Land Programme

Under Lab-to-Land Programme of the ICAR 300 farm families were adopted by the TNAU Centres. The Krishi

Vigyan Kendras at Coimbatore, Madurai, Trichy, Pondicherry, Vridhachalam and Kattupakkam were allotted 50 families each for adoption. Details of the number of families under different social categories were as follows:

Social Category	No. of families adopted
Scheduled castes	143
Backward communities	149
Other castes	3
Schools adopted (KFSC, Trichy)	5
Total	300

Technical guidance and input support were rendered by the Kendras to the families in agriculture, animal husbandry, home science, agricultural engineering, sericulture etc. The details of input support given for the adopted families were as follows.

Seed supply

Cholam	— 300 kg
Soyabean	— 300 kg
Groundnut	— 1920 kg
Blackgram	— 130 kg
Vegetables	— 10.75 kg
Culture Packets	— 239 Nos.

Chemicals

BHC dust	— 500 kg
Malathion	— 500 kg
Entolux	— 30 x 250 ml
Calyxin	— 2.0 litres
Dithane	— 26 kg
Bavistin	— 500 gm
Neem cake	— 2700 kg
Urea	— 3000 kg
DAP	— 530 kg
Super phosphate	— 750 kg
Muriate of potash	— 625 kg
Micronutrient mixture	— 120 kg
17 : 17 : 17 Complex	— 450 kg

Tools and Implements

Garden Tools	— 5 sets
Crowbar, Ironpan and Mammutty	— 10 sets
Iron plough	— 40 Nos.

Poultry

Austro white pullets	— 192 Nos.

Distant Learning Programmes

Lessons relating to fruit cultivation, oilseeds, bio-energy and water management in drought were offered under Farm School on All India Radio benefiting 2824 registered farmers and other farmers indirectly.

The contact programme for agro-based industry and fruit cultivation were held at Agricultural College and Research Institute, Madurai and Horticultural Research Station, Periyakulam. More than 200 farmers participated and were consequently benefited.

Correspondence Course

Eight courses on new irrigation devices, new plant protection methods, dairy farming, farm implements and machinery, banana cultivation, new poultry farming, sericulture and turmeric cultivation were offered for which 182 farmers had been enrolled and benefited. A three-day contact programme for each of these courses was organised and 50 farmers participated in them.

Video Library

The Plan scheme entitled 'Establishment of Video Library' had come into operation from April, 1987 at the Communication Centre, Coimbatore. The Video Library was started to facilitate the production and distribution of cassettes to the registered institution like Panchayats, Cooperatives, Schools etc in addition to the registered farmers for speedy dissemination of technology developed by the University. It has been planned to produce colour video films on important crops in addition to dairy farming, poultry farming, fish culture, agro-forestry, farm implements and tools and home science aspects to cater to the needs of different clientele in the State. Six Video programmes covering poultry keeping, bee keeping, azolla multiplication, sericulture, mushroom cultivation and coconut wilt disease were recorded and used for the benefit of farmers and extension workers. The Video Library Scheme has been strengthened with the purchase of 'U' matic video equipments at a cost of about Rs. 8.29 lakhs.

Training Unit

The training unit of the Directorate of Extension Education conducted 27 T&V Training programmes benefiting 483 extension personnel during 1987-88. The topics covered were paddy and vegetable cultivation, dairying, farm machinery, water management, fisheries, social forestry, pulse production, cotton production and protection etc.

The training unit also organised 33 training programmes for 662 other category of beneficiaries. The details of the number of trainings offered by TNAU centres and kinds of beneficiaries are given in Table I.

Contacts

The number of group and individual contacts carried out by various TNAU Extension units during 1987-88 are summarised in Table-II.

Information Support

The TNAU Extension centres provided information support in various forms besides publishing monthly and quarterly journals. The details are given in Table. III.

Valarum Velanmai

This is a Tamil monthly journal published by the Communication Centre, Coimbatore with 10000 subscribers. It published 180 articles during the year under report. A special *pongal* issue was also released.

Kalnadai Kathir

This is a Tamil quarterly journal in animal sciences published from the Veterinary College, Madras. About 10,000 copies were printed and distributed to farmers and field personnel.

Uzhavar Thunaivan

The Agricultural College and Research Institute, Madurai brings out this Tamil monthly journal.

TNAU Newsletter

The monthly newsletter carries latest research articles in brief and also the training programmes carried out by

various wings of the University. Nearly 1000 copies were sent every month to various agricultural universities, research organisations, eminent scientists etc., in the country and abroad.

Breeder Seed Production

During 1987 - 88 the quantity of breeder seeds produced and distributed was as follows :

Crop	Quantity produced & distributed (kg)
Paddy	10120.00
Millets	694.00
Pulses	13951.00
Oilseeds	97776.00
Cotton	245.00
Vegetables	32.38

Adaptive Research Trials

Fifty - three cultures of paddy, sorghum, bajra, maize, ragi, blackgram, greengram, horsegram, groundnut, sesamum, sunflower, castor, mustard and cotton were evaluated in farmers' holdings during 1987-88 over 1780 locations.

On-farm Trials

On-farm trials on management practices were conducted in 150 locations The plant protection staff of the State Departments of agriculture and horticulture, TNAU Scientists and extension scientists at Krishi Vigyan Kendras and Plant Clinic Centres and the staff of the National Demonstration Scheme were engaged in the conduct of on-farm research on 22 selected plant protection topics.

TABLE : I NO. OF TRAININGS CONDUCTED

S.No.	Centre	No. of trainings	Beneficiaries (Number)				
			Farmers	Farm Women	Extn. Workers	Students	Others
1.	KVK, Coimbatore	60	1031	294	192	—	290
2.	KVK, Madurai	63	1085	312	232	160	246
3.	KVK, Trichy	121	1793	560	1673	922	—
4.	KFSC, Pondicherry	36	1683	—	150	—	—
5.	KVK, Vridhachalam	137	6790	624	—	—	—
6.	KVK, Kattupakkam	84	1487	507	680	30	—
7.	PCC, Vellore	12	8	2	2	—	—
8.	PCC, Tirunelveli	23	342	—	429	—	25
9.	PCC, Tirur	20	187	128	355	—	—
10.	PCC, Salem	30	250	200	890	—	—
11.	PCC, Srivilliputhur	32	294	—	497	27	—
12.	NDS, Salem	61	541	—	16	14	174
13.	RRS, Aruppukkottai	28	410	93	—	—	—
14.	TRRI, Aduthurai	12	1505	110	—	—	—
15.	Commn. Centre, Madras	5	—	—	125	—	—
16.	PRDC, Trichy	6	98	—	—	—	—
17.	PRDC, Rajapalayam	3	15	—	—	50	—
18.	LRDC, Thanjavur	4	96	—	—	—	—
19.	LRDC, Nagercoil	1	10	—	—	—	—
	Total	738	17625	2830	5241	1203	735

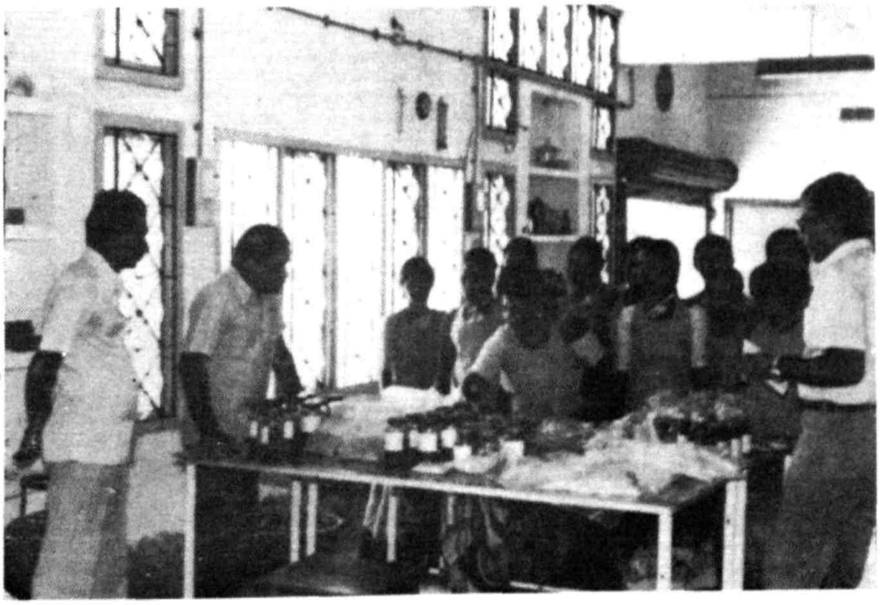
TABLE : II INDIVIDUAL / GROUP CONTACTS

S. No.	Centre	Demonstrations	Compact Block Demns.	Village Meetings	Farm/ Field Day/ Visits	Farmers' Days	Farm Adv. Service	No. of queries answered
1.	KVK, Coimbatore	64	4	20	6	1	105	208
2.	KVK, Madurai	115	—	24	3	1	47	127
3.	KVK, Trichy	33	—	4	7	—	35	32
4.	KFSC, Pondicherry	—	—	—	—	—	—	—
5.	KVK, Vridhachalam	135	—	—	6	1	48	92
6.	KVK, Kattupakkam	39	—	13	1	1	—	18
7.	PCC, Vellore	11	—	12	—	—	74	10
8.	PCC, Tirunelveli	20	—	29	—	—	204	30
9.	PCC, Tirur	15	—	22	—	3	408	55
10.	PCC, Salem	17	—	27	4	—	191	—
11.	PCC, Srivilliputhur	11	—	16	—	1	415	275
12	NDS, Salem	285	10	5	57	—	—	—
13.	RRS, Aruppukkottai	11	—	—	—	1	—	—
14.	Commn. Centre, Coimbatore	—	—	—	—	—	—	911
15	Commn. Centre, Madras	—	—	—	—	1	—	—
16.	PRDC, Vellore	—	—	1	—	—	332	599
17.	PRDC, Pudukkottai	—	—	—	—	—	251	232
18.	PRDC. Trichy	6	—	—	—	—	264	893
19.	PRDC, Rajapalayam	—	—	10	—	—	330	736
20.	PRDC, Madurai	—	—	—	—	—	275	113
21.	PRDC, Namakkal	—	—	—	—	—	503	2477
22.	LRDC, Erode	56	—	—	—	—	—	—
23.	LRDC, Thanjavur	7	—	—	—	—	172	426
24.	LRDC, Nagercoil	—	—	17	—	—	—	1056
25.	LRDC, Tirunelveli	—	—	—	—	—	140	1312
	Total	825	14	200	84	10	3794	9602

TABLE : III MASS MEDIA UTILISATION PROGRAMME

Sl. No	Centre	Writing to dailies and farm magazines	Radio prog. announcements	T. V. prog./ announcements	Publications (leaflets etc.) brought out	Slide/film shows	Exhibitions	Campaigns
1.	KVK, Coimbatore	7	10	–	10	2	5	2
2.	KVK, Madurai	13	7	3	4	23	8	2
3.	KVK, Trichy	16	7	1	3	–	–	2
4.	KFSC, Pondicherry	–	–	–	–	–	–	–
5.	KVK, Vridhachalam	16	12	–	11	8	40	–
6.	KVK, Kattupakkam	7	7	3	5	–	2	–
7.	PCC, Vellore	1	13	–	–	2	–	–
8.	PCC, Tirunelveli	7	7	–	1	7	1	–
9.	PCC, Tirur	4	11	–	4	–	–	–
10.	PCC, Salem	11	11	–	8	–	–	–
11.	PCC, Srivilliputhur	–	8	–	8	2	1	–
12.	NDS, Salem	6	10	–	1	–	–	–
13.	RRS, Paiyur	9	–	–	–	–	–	–
14	RRS, Aruppukottai	–	3	–	–	–	10	–
15.	HRS, Thadiyankudisai	–	–	–	–	–	–	–
16.	TRRI Aduthurai	50	35	1	–	–	10	–
17.	Commn. Centre, Coimbatore	121	147	76	–	–	10	–
18	Commn. Centre, Madras	–	–	–	–	–	1	–
19.	PRDC, Vellore	6	1	–	3	–	–	–
20.	PRDC, Tirupur	5	1	–	–	–	–	–
21.	PRDC, Trichy	7	11	1	2	3	1	–
22	PRDC, Rajapalayam	3	–	–	1	–	–	–
23.	PRDC, Madurai	8	1	–	–	–	–	–
24.	PRDC, Namakkal	3	–	–	–	–	–	–
25.	LRDC, Erode	2	–	–	–	–	1	9
26.	LRDC, Thanjavur	1	1	–	1	–	–	–
27.	LRDC, Nagercoil	3	3	–	–	–	–	–
28.	LRDC, Tirunelveli	4	2	–	–	–	–	–
	Total	310	310	85	62	47	90	15

Hon'ble Agricultural Minister of Pondicherry Thiru V. Govindaraju,
Distributing Inputs to Farmers under the Lab-to-Land Programme



Women Trainees at Fisheries College, Tuticorin

Vice-Chancellor at the Exhibition Hall, KVK, Pondicherry

Farmers' Day at TRRI, Aduthurai

Mass Contact Programme at Kadambur Village

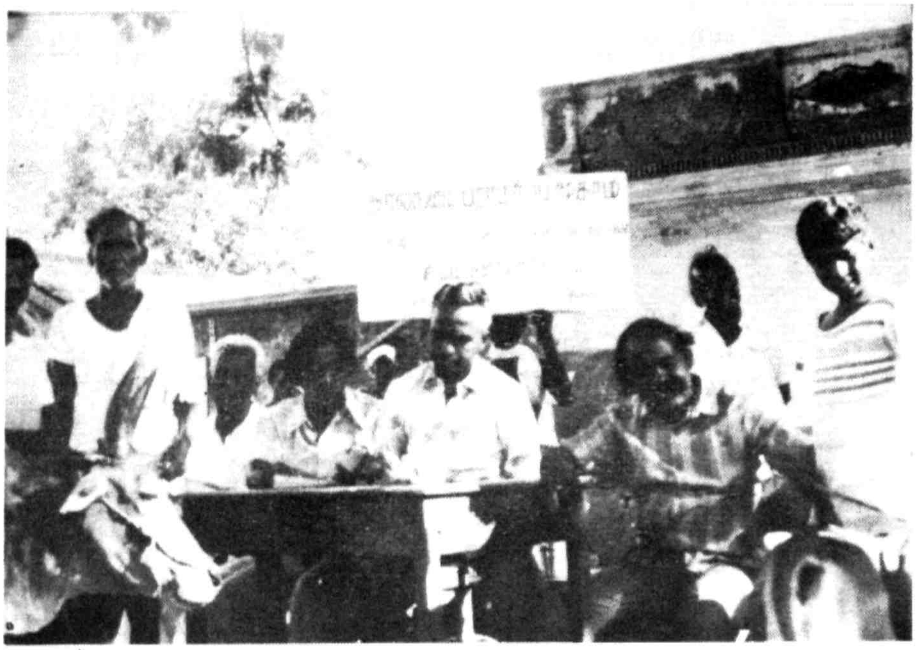
National Demonstration Plot, Salem

Farmers' Day at AC & RI, Madurai

Scientist Examining a Buffalo During Infertility Campaign

Mass Campaign Programme at Kattamitta Village, North Arcot District

Solar Cooker Demonstration at KVK, Pondicherry

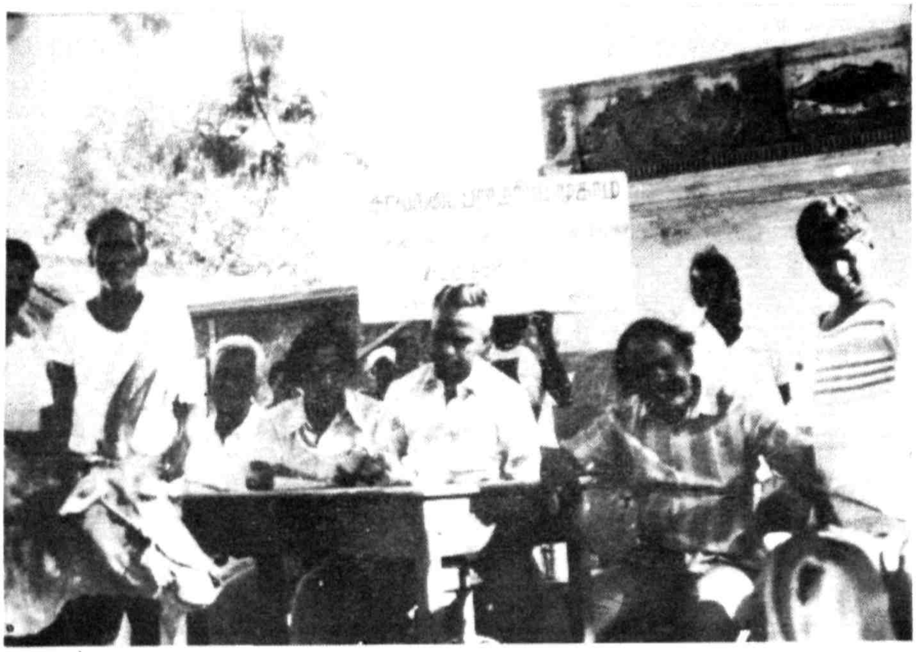


Off-Campus Training by KVK, Pondicherry

Seed Treatment Demonstration at Salem

Field Celebration at Coimbatore

Rice Field under National Demonstration Scheme - Salem



Off-Campus Training by KVK, Pondicherry

Seed Treatment Demonstration at Salem

Field Celebration at Coimbatore

Rice Field under National Demonstration Scheme - Salem

Farmers' Day at ARS, Bhavanisagar

APPENDIX I

CIVIL WORKS COMPLETED IN 1987-88

Main Campus, Coimbatore

1. Administrative building
2. Communication centre
3. Seed processing complex
4. Overhead tank for students' hostel
5. Laying PVC pipe lines in Millet Breeding Station
6. Zoo in the botanical gardens
7. Staff quarters
8. Mens' hostel
9. Improvement to play ground & stadium
10. Farmers' hostel
11. Material science building
12. Laboratory for Soil & Water Conservation Department
13. Additional dining hall for teachers' hostel
14. Glass house for horticulture
15. Screen house for School of Genetics
16. Irrigation grid
17. Screen house for Plant Pathology
18. Screen house for Entomology
19. Laboratory for biological research in Pulses

Agrl.College & Research Institute, Madurai

1. Home Science Students' hostel
2. Staff quarters
3. Teachers' hostel
4. Ladies hostel for Home Science Students
5. Recreation hall
6. Screen house
7. Irrigation grid

Agrl.College, Killikulam

1. Hostels I, II, III & IV
2. Laboratory I & II
3. Administrative block
4. Lecture hall
5. Canteen block
6. Farm buildings

Fisheries College, Tuticorin

1. Students' hostel
2. Staff quarters
3. Reservoir
4. Hatchery unit
5. Formation of roads
6. Laboratory and college buildings

Veterinary College, Madras

1. Communication centre
2. Microbiology laboratory building
3. Staff quarters
4. Sports cafeteria
5. Additional laboratory
6. Students' hostel
7. Farmers' hostel
8. Ambulatory clinic

Veterinary College & Research Institute, Namakkal

1. Sheds for college
2. Additional two class rooms

Agrl.Research Station, Bhavanisagar

1. Staff quarters
2. ICRISAT store shed
3. Screen house

Agrl.Research Station, Kovilpatti

1. Staff quarters

Horticultural Research Station, Periyakulam

1. Laboratory

Poultry Research Station, Teynampet

1. Improvements to broiler houses
2. Improvements to layer houses

Livestock Research Station, Kattupakkam

1. Conversion of TANSI shed B & C into bull shed and calf pen
2. Generator room
3. Laboratory
4. Rat proof godown
5. Thrashing floor
6. Cattle shed and vehicle shed

Regional Research Station, Paiyur

1. Laboratory
2. Glass house
3. Rat proof godown
4. Open shed, thrashing floor
5. Cattle, implement and vehicle sheds
6. Staff quarters
7. Trainees' hostel

Tamil Nadu Rice Research Institute, Aduthurai

1. Cattle, implement and vehicle sheds
2. Rat proof godown
3. Thrashing floor

National Pulses Research Centre, Vamban, Pudukkottai

1. Laboratory
2. Cattle shed and implement shed
3. Thrashing floor

4. Rat proof godown
5. Green house
6. Staff quarters

Regional Research Station, Aruppukkottai

1. Laboratory
2. Cattle and implement shed
3. Thrashing floor
4. Rat proof godown
5. Green house
6. Staff quarters
7. Trainees' hostel

Horticultural Research Station, Thadiyankudisai

1. Net house

Agricultural Research Station, Aliyarnagar

1. T & V meeting hall

Soil Salinity Research Centre, Trichy

1. Regional laboratory

Sugarcane Research Station, Sirugamani

1. T & V meeting hall

Rice Research Station, Tirur

1. Screen house

Sugarcane Research Station, Melalathur

1. **T & V meeting hall**

Mecheri Sheep Research Station, Pottaneri

1. Staff quarters

Cotton Research Station, Srivilliputhur

1. Screen house
2. Laboratory
3. Cattle, implement & vehicle sheds
4. Thrashing floor
5. Rat proof godown
6. Staff quarters

Oilseeds Research Station, Tindivanam

1. Laboratory
2. Cattle shed
3. Thrashing floor
4. Open shed
5. Rat proof godown
6. Staff quarters

Regional Research Station, Vridhachalam

1. Laboratory
2. Rat proof godown
3. Implement shed
4. Cold storage & Mist chamber
5. Screen house
6. Thrashing floor
7. Staff quarters
8. Trainees' hostel

Sugarcane Research Station, Cuddalore

1. Laboratory
2. Green house
3. Rat proof godown
4. Cattle shed
5. Vehicle shed
6. Thrashing floor
7. Open shed
8. Staff quarters

Agricultural Research Station, Thirupathisaram

1. Laboratory
2. Farm structures

APPENDIX II

LIST OF SCHEMES

University Research Schemes - Non - Plan

		1987-88 Revised Estimate (Rs.)
1.	Scheme for Improvement of Groundnut through Induction of Mutation, Coimbatore	59,000
2.	Scheme for Surveillance of Pests and Diseases, Vellore	85,000
3.	Scheme for Studies on the Residues of Pesticides in Plant and Soil, Coimbatore	2,23,000
4.	Scheme for Research on Citrus Die-back, Tenkasi	1,10,000
5.	Scheme for Research on Citrus Die-back, Coimbatore	35,000
6.	Scheme for Intensification of Pulses Research, Vamban	64,000
7.	Scheme for Improvement of Redgram and Soybean, Vamban	48,000
8.	Scheme for Evolution of Cumbu Resistant to Green Ear, Vamban	99,000
9.	Scheme for Evolution of Cumbu Resistant to Green Ear, Kovilpatti	79,500
10.	Scheme for Maximisation of Pulses Production, Vamban	59,000
11.	Scheme for Improvement of Millets for Grain and Fodder, Kovilpatti	1,04,000
12.	Scheme for Improvement of Sunflower in Tamil Nadu, Kovilpatti	1,33,000
13.	Scheme for Improvement of Wetland Pulses, Aduthurai	2,19,000
14.	Scheme for Coordinated Agronomic Experiment on Sugarcane, Villupuram	2,50,000
15.	Scheme for Coordinated Agronomic Experiment on Sugarcane, Trichy	3,28,000

16.	Scheme for Research on Nematode Parasites of Sugarcane, Cuddalore	1,73,000
17.	Scheme for Biological Testing of Pesticides Laboratory, Vamban	10,000
18.	Scheme for Biological Testing of Pesticides Laboratory, Kovilpatti	58,000
19.	Scheme for Biological Testing of Pesticides Laboratory, Aduthurai	52,000
20.	Scheme for Biological Testing of Pesticides Laboratory, Tindivanam	59,000

University Research Schemes - Plan

1.	Research Project on Breeders Seed Increase, Bhavanisagar	2,98,900
2.	Research on temperate vegetables, Sandynallah	83,700
3.	Research on temperate vegetables, Kodaikanal	43,300
4.	Research on temperate vegetables, Thadiyankudisai	23,000
5.	National Pulses Res.Centre, Pudukkottai	3,89,200
6.	Regional Research Station, Aruppukottai	5,58,000
7.	Strengthening and coordinating rice entomological Research, Coimbatore	1,94,400
8.	Strengthening and coordinating rice entomological Research, Madurai	92,600
9.	Plant Clinic Centre, Vellore	1,08,400
10.	Plant Clinic Centre, Tirunelveli	93,700
11.	Plant Clinic Centre, Tirur	82,100
12.	Plant Clinic Centre, Salem	1,41,800
13.	Plant Clinic Centre, Srivilliputhur	76,700
14.	Development of sugarcane varieties suitable for southern district, Madurai	1,45,700
15.	Establishment of Regional Laboratory, Tiruchi	1,13,200
16.	Establishment of Regional Laboratory, Paiyur	1,47,800
17.	Establishment of Regional Laboratory, Yercaud	94,100

18.	Banana Research Station,Virinjipuram, Vellore	3,00,300
19.	Strengthening and coordinating rice virus diseases and Mycoplasma diseases, Coimbatore	65,600
20.	Strengthening and coordinating rice virus diseases and Mycoplasma diseases, Madurai	1,03,200
21.	Research on bunchy top virus diseases, Thadiyankudisai	63,000
22.	Research on improvement of chillies in the Southern districts, Paramakudi	1,46,000
23.	Establishment of a Horticultural Complex,Kattupakkam	1,47,100
24.	Research on improvement of cultivation of palmyrah palm, Srivilliputhur	2,23,000
25.	Research on improvement of cultivation of palmyrah palm, Madurai	24,800
26.	Turmeric Research Scheme, Bhavanisagar	1,18,800
27.	Crop Pattern Scheme, Coimbatore	1,22,400
28.	Crop Pattern Scheme, Vellore	1,02,100
29.	Crop Pattern Scheme, Tirunelveli	84,900
30.	Crop Pattern Scheme, Pattukottai	63,900
31.	Seed Technology unit, Madurai	1,26,600
32.	Krishi Vigyan Kendra, Coimbatore	4,36,400
33.	Krishi Vigyan Kendra, Madurai	3,89,000
34.	Hybrid development by mass production of haploid and homozygous plants in hybrid rice and sorghum by anther and pollen culture, Coimbatore	60,800
35.	Intensification of research on medium staple cotton types, Srivilliputhur	61,900
36.	Intensification of research on medium staple cotton types, Kovilpatti	60,000
37.	Intensification of research on medium staple cotton types, Aduthurai	54,000
38.	Intensification of research on medium staple cotton types, Paiyur	62,900
39.	Intensification of research on medium staple cotton types, Theni	

40.	Establishment of a centre for Sericulture, Coimbatore	1,67,100
41.	Evolution of medium staple cotton suitable for black soil rainfed tracts of Southern districts, Kovilpatti	70,200
42.	Starting of P.G.diploma in Plant Protection,Coimbatore	2,27,200
43.	High yielding crop varieties for LBP area,Bhavanisagar	68,800
44.	Research on chemistry of submerged soils of Thanjavur district, Aduthurai	66,000
45.	Research on introduction of new tree species in Tamil Nadu, Mettupalayam	65,900
46.	Research on introduction of new tree species in Tamil Nadu, Pudukkottai	24,000
47.	Research on introduction of new tree species in Tamil Nadu, Tirunelveli	5,000
48.	Research on introduction of new tree species in Tamil Nadu, Coimbatore	5,000
49.	Scheme for vegetable seed production, Palur	77,900
50.	Popularisation of agrl.implements through Krishi Vigyan Kendra, Coimbatore	48,000
51.	Popularisation of agrl.implements through Krishi Vigyan Kendra, Madurai	28,100
52.	Improvement of minor pulses and synthesising hybrid varieties of sesamum, Coimbatore	1,52,300
53.	Rural Development studies CARDS,Coimbatore	82,000
54.	Seed production and seeds storage studies in sub tropical and temperate crops, Kodaikanal	
55.	Seed production and seed storage studies in sub tropical and temperate crops, Thadiyankudisai	1,00,300
56.	Seed Production and seed storage studies in sub tropical and temperate crops, Periyakulam	
57.	Improvement of groundnut suitable for rainfed areas, Tindivanam	81,700
58.	Strengthening of P.G.teaching and research in Agrl. Management Economics, Coimbatore	73,100

59.	Improvement of forage grasses, legumes and pasture development, Aruppukottai	35,000
60.	Improvement of forage grasses legumes and pasture development, Paiyur	33,200
61.	Improvement of forage grasses legumes and pasture development, Erode	55,400
62.	Research on oil bearing tree crops like neem, pungam and silvagronomical studies of energy fuel yielding woodlots, Aruppukottai	52,000
63.	Research on oil bearing tree crops like neem, pungam ano silvagronomical studies of energy fuel yielding woodlots, Mettupalayam	27,000
64.	Formation of improved agro-technique in grapes suitable for Dharmapuri, Paiyur	94,200
65.	Establishment of a centre for nematode pests of crop plants, Madurai	83,900
66.	Improvement of brinjal varieties for North Eastern Region, Palur	75,200
67.	Studies on the causes of low soil fertility in Chingleput, Tirur	75,900
68.	Establishment of Seed complex including Seed Health Testing and Training Centre,Bhavanisagar	97,800
69.	Strengthening seed production programme,Pattukottai	40,600
70.	Starting of bio-fertilizer production and quality control unit, Coimbatore	1,41,500
71.	Starting of bio-fertilizer production and quality control unit, Madurai	65,600
72.	Research and development of forage crops,Coimbatore	62,200
73.	Evolving soil crusting and hardening problems in Tamil Nadu and to evolve suitable economic soil management practices, Pudukkottai	56,000
74.	Intensification of research on soyabean cultivation, Aduthurai	41,600
75.	Intensification of research on soyabean cultivation, Paiyur	44,000
76.	Strengthening the coconut research in Thanjavur Veppankulam	1,84,200

77.	Advance centre for S&CMS, Coimbatore	1,27,200
78.	Strengthening the training division in the Directorate of Extension Education,Coimbatore	2,52,400
79.	Research on improvement of coriander and vegetables, Aruppukottai	48,000
80.	Socio economic study on tribal welfare in the Lower Palni hills, Thadiyankudisai	45,800
81.	Studies on production physiology on rice, Madurai	63,400
82.	Establishment of Wetland Banana Research Station, Sirugamani	40,100
83.	Establishment of Agricultural Research Station in North Arcot, Vellore	2,46,500
84.	Strengthening of Estate Office, Coimbatore	2,32,200
85.	Starting of M.E(Ag) degree programme in Post harvest Technology, Coimbatore	5,000
86.	Studies on materials and methods of farm structures, Coimbatore	42,300
87.	Upgrading of TRRI.,Aduthurai	1,92,000
88.	Agricultural College, Killikulam	34,26,000
89.	Studies on wilt and button shedding in coconut, Nagercoil	1,13,800
90.	Development of breeder seed on millets,Kovilpatti	1,38,600
91.	Development of breeder seed on millets, Vamban	50,000
92.	Establishment of Nematology Laboratory, Tirur	2,08,800
93.	Establishment of Nematology Laboratory, Tiruchi	2,04,400
94.	Establishment of biological control testing laboratory, Paiyur	1,32,400
95.	Production of breeders seed in paddy,Aduthurai	74,800
96.	Improvement of Manjamakkattai and Thalaivirichan cholam, Vamban	87,300
97.	Upgrading the Sugarcane Expt. Station,Cuddalore	2,57,400
98.	Strengthening of Multicrop Research Station, Vamban	84,900
99.	Advanced centre for Plant Protection Studies, Coimbatore	1,92,500

100.	Multiplication and distribution of Pulses,Vamban	49,000
101.	Multiplication and distribution of Pulses,Coimbatore	59,700
102.	Multiplication and distribution of Pulses,Tindivanam	76,100
103.	Biological control of crop pests, Coimbatore	74,800
104.	Strengthening of breeders seed programme, Vridhachalam	1,00,000
105.	Strengthening of breeders seed programme,Tindivanam	1,20,700
106.	Strengthening of breeders seed programme, Coonoor	25,000
107.	Strengthening of breeders seed programme,Kattupakkam	33,400
108.	Commercial exploitation of heterosis in rice, Aduthurai	76,000
109.	Radiation research on soil and crop management studies, Coimbatore	1,28,600
110.	Studies on epidemiology and integrated management of rice blast disease, Coimbatore	89,300
111.	NARP - Strengthening the Directorate of Research Coimbatore	1,95,000
112.	NARP - Strengthening the TRRI,Aduthurai with special centres, Aduthurai	47,300
113.	NARP - Strengthening the TRRI, Aduthurai with special centres, Tiruchi	2,50,000
114.	NARP - Strengthening the Regional Research Station, Paiyur	3,65,000
115.	NARP - Biological research on Pulses, Coimbatore	2,06,000
116.	NARP - Strengthening the Regional Research Station, Vridhachalam	1,44,300
117.	NARP - Strengthening the Regional Research Station, Tindivanam	11,700
118.	NARP - Strengthening the Regional Research Station, Cuddalore	60,000
119.	NARP - Strengthening the Regional Research Station, Kattupakkam	46,000
120.	NARP - Strengthening the Regional Research Station, Aruppukottai	2,14,900
121.	NARP - Strengthening the Horticultural Research Station, Thadiyankudisai	1,000

122.	NARP - Strengthening the Regional Research Station, Srivilliputhur	10,100
123.	NARP - Strengthening the Regional Research Station, Pudukkottai	10,000
124.	NARP - Estt.of Horticultural Research Station, Thirupathisaram	15,000
125.	Scheme for fortification of inbred line of sorghum, Coimbatore	1,08,200
126.	Studies on behavioural control of polyphagous insects, Coimbatore	62,500
127.	Micropropagation of horticultural plants,Coimbatore	54,800
128.	Suitable strains of Azospirillum for commercial crops, Coimbatore	79,600
129.	Development of model for growth of crop plants, Coimbatore	1,02,600
130.	Creation of new Department of Bio-technology, Coimbatore	1,50,000
131.	Development of tamarind tree,Paiyur	51,400
132.	Exploitation of hybrid vigour and development of superior hybrids in redgram, Coimbatore	1,20,000
133.	Biological control of soil borne plant pathogens, Coimbatore	72,600
134.	Studies on the decline in the yield of grapes, banana, tomato and brinjal due to nematodes and fungus, Periyakulam	1,34,700
135.	Improvement of nutritive value of food utilising specific microbial strains in traditional fermented foods, Madurai	91,400
136.	Scheme for establishment of Video Library, Coimbatore	5,04,700
137.	Research on afforestation of saline soils in Tamil Nadu, Tiruchi	1,05,000
138.	Integrated Farming system, Coimbatore	1,73,200
139.	Water Technology Centre, Coimbatore	6,09,000

ICAR Schemes (Agriculture) - Fully Financed

		1987-88 (Revised Estimate) (Rs.)
1.	Establishment of Krishi Vigyan Kendra at Trichy	5,20,000
2.	Establishment of Krishi Vigyan Kendra, Pondicherry	7,32,000
3.	Establishment of Krishi Vigyan Kendra, Kattupakkam	21,000
4.	Establishment of Krishi Vigyan Kendra, Vridhachalam	2,70,000
5.	Production of Breeder Seed-Annual Oilseed crops Bhavanisagar	3,50,000
6.	Development of Hybrid rice - Directorate of School of Genetics, Coimbatore	96,500
7.	Conjunctive use of ground water, CARDS,Coimbatore	1,34,600
8.	Scheme for Breeders Seeds-National seeds project, ARS, Bhavanisagar	6,55,850
9.	Scheme for viability and storability of ground-water - AC&RI., Coimbatore	22,800
10.	Scheme for Coordinated Scheme on National Demonstration on Major Food Crops,Salem	2,43,000
11.	AICORP for the rapid improvement of Agri.Technology directed at Socio.upliftment of SC&BC, RRS, Aruppukottai	1,88,500
12.	Lab-to-Land programme, Krishi Vigyan Kendra, Coimbatore	
13.	Lab to Land Programme, Krishi Vigyan Kendra, Pondicherry	29,500
14.	Lab to Land Programme, Krishi Vigyan Kendra,Trichy	29,500
15.	Lab to Land Programme, Krishi Vigyan Kendra, Vridhachalam	29,500
16.	Lab to Land Programme, Krishi Vigyan Kendra, Kattupakkam	29,500
17.	Biological fixationof nitrogen fertilizer, Coimbatore	1,47,800
18.	Scheme for nitrogen fertilizer efficiency under Indo-US Collaboration, SCMS, Coimbatore	6,69,200
19.	Scheme for increased income and Employment through optimal farm planning and identification of contraints-CARDS,Coimbatore	71,100

20.	Breeder seed production (Vegetable), Faculty of Horticulture, Coimbatore	66,200
21.	Isolation and identification of antiviral principles in plant extracts and preparation of effective antiviral formulation, Dept.of Bio Chemistry, Coimbatore	31,250
22.	Studying the impact of modernisation in agriculture on women with special reference to rice farming systems in the country, D.E.E., Coimbatore	40,000
23.	Breeder seed of annual oilseed crops-Groundnut seed production centre, RRS, Vridhachalam	58,000
24.	Potato cyst nematodes scheme for investigations on best plant resistance and cultural methods of control, Coimbatore	
25.	Development of Homozygous dihaploid lines from India x Japonica hybrids through androgenesis-in rice, Coimbatore	
26.	Evaluation of high yielding fodder types in small millets, Coimbatore	2,03,800
27.	AICRP on Rice Improvement, Coimbatore	3,91,000
28.	AICRP on Rice Improvement, Aduthurai	3,98,900
29.	AICRP on Rice Improvement, Madurai	38,600
30.	AICRP on Rice Improvement, Pondicherry	1,85,700

ICAR Scheme (Agriculture) - Partly Financed

1.	Coordinated Research Project on Water Management, Bhavanisagar	3,55,500
2.	All India Coordinated Agronomic Research Project-Cropping System Research,Coimbatore	5,52,000
3.	Scheme for Water Management and Soil Salinity, Madurai	3,49,500
4.	All India Coordinated Research Project for Dryland Agriculture, Kovilpatti	3,60,000
5.	All India Coordinated Research Project on Soil Test with Crop Response, Coimbatore	2,34,000

6.	All India Coordinated Research Project on Sugarcane, Cuddalore	62,700
7.	All India Coordinated Agronomic Research Project-Experiment on Cultivators' Field, Tirur	2,05,500
8.	All India Coordinated Agronomic Research Project-Experiment on Cultivators' Field, Pudukkottai	1,81,000
9.	All India Coordinated Agronomic Research Project-Experiment on Cultivators' Field, Bhavanisagar	1,92,000
10.	All India Coordinated Agronomic Research Project-Model Agronomic Experiment, Tanjore	1,26,500
11.	All India Coordinated Research Project on Oilseeds, Coimbatore	2,13,300
12.	All India Coordinated Research Project on Oilseeds, Bhavanisagar	60,850
13.	All India Coordinated Research Project on Oilseeds, Aliyarnagar	1,10,100
14.	All India Coordinated Research Project on Oilseeds-Main-centre for Groundnut, Vridhachalam	6,49,000
15.	All India Coordinated Research Project on Oilseeds-Sub Centre for Caster Research, Tindivanam	1,09,900
16.	All India Coordinated Research Project for Improvement of Small Millets, Coimbatore	1,77,500
17.	All India Coordinated Research Project for Improvement of Sorghum, Coimbatore	3,42,000
18.	All India Coordinated Research Project on Jute and Allied Fibres, Coimbatore	95,300
19.	All India Coordinated Cotton Improvement Project (Breeding and Agronomy parts), Coimbatore	4,51,000
20.	All India Coordinated Cotton Improvement Project (Breeding and Agronomy parts), Kovilpatti	1,78,600
21.	All India Coordinated Cotton Improvement Project (Breeding and Agronomy parts), Srivilliputhur	3,10,100
22.	All India Coordinated Research Project on Improvement of Pulses, Coimbatore	4,47,000

23.	All India Coordinated Research Project for Intensification of Research on the Improvement of Pulses, Vamban	4,34,000
24.	All India Coordinated Research Project on Soyabean, Coimbatore	96,300
25.	All India Coordinated Research Project on Forage Crops, Coimbatore	1,95,000
26.	All India Coordinated Research Project on Plant Parasitic Nematodes with Integrated Approach for Their Control, Coimbatore	1,90,200
27.	All India Coordinated Research Project on Pesticides Residues, Coimbatore	1,83,100
28.	Scheme on Coordinated Research on Biological Nitrogen Fixation, Coimbatore	1,20,000
29.	All India Coordinated Research Project on Seed Borne Diseases, Coimbatore	1,10,000
30.	All India Coordinated Research Project on Tuber crops (Other than potato) , Coimbatore	1,44,000
31.	All India Coordinated Vegetable Improvement project (including Chillies), Coimbatore	1,97,000
32.	All India Coordinated Research Project-Semi-arid Fruits, Coimbatore	3,34,000
33.	All India Coordinated Research Project on spices, Coimbatore	1,14,000
34.	All India Coordinated Research Project on spices, Vridhachalam	1,68,000
35.	All India Coordinated Research Project on Palms, Veppankulam	2,83,000
36.	All India Coordinated Research Project on Palms, Coimbatore	44,000
37.	All India Coordinated Fruit Improvement Projects, Periyakulam	2,07,000
38.	All India Coordinated Floriculture Improvement Project, Coimbatore	1,76,000
39.	All India Coordinated Fruit Improvement Project, Aruppukkottai	5,24,000
40.	Scheme for Research on Cardamom,Yercaud	98,000

41.	All India Coordinated Research Programme on on Post harvest Technology in Horticultural crops, Periyakulam	2,04,000
42.	All India Coordinated Research Project on Under Utilised and Under Exploited Plants, Mettupalayam	1,15,600
43.	All India Coordinated Research Project on Agro Forestry, Mettupalayam	1,27,500
44.	All India Coordinated Mushroom improvement Project, Coimbatore	1,40,000
45.	Scheme for Studies on Harvest and Post Harvest Technology, Coimbatore	4,56,000
46.	Scheme for Energy Requirements in Intensive Agricultural Production, Coimbatore	4,85,200
47.	All India Coordinated Scheme and Research and Development of Farm Implements and Machinery and Production of Prototypes and Their Evaluation Under Different Agro-climatic conditions, Coimbatore	6,43,700
48.	Scheme for Intensive Testing Power Tiller Research and Development of New Machines, Coimbatore	2,22,100
49.	Scheme for All India Coordinated Research Project on Renewable energy sources for Agricultural and Agro-based Industries, Coimbatore (Solar Energy, Wind Energy and Bio-Gas Technology)	1,49,500
50.	All India Coordinated Research Project on Long Term Fertilizer Experiments,Coimbatore	88,600
51.	All India Coordinated Scheme on Micro-nutrients of Soil, Coimbatore	2,23,200
52.	All India Coordinated Scheme for Studies on Measurement, Evaluation and Improvements of Soil physical conditions to increase Agricultural production of problematic Areas, Coimbatore	2,17,000
53.	All India Coordinated Research Project on Betelvine Disease, Sirugamani	1,59,600
54.	All India Coordinated Research Project on Weed Control, Coimbatore	3,66,000
55.	All India Coordinated Research Project on Biological Control of Crop Pests and Weeds, Coimbatore	1,69,000

56.	All India Coordinated Research Project on Palms, Aliyarnagar	1,91,000
57.	All India Coordinated Research Project on Agro-Meteorology, Kovilpatti	2,17,000
58.	AICRP on Maize, Coimbatore	1,87,700
59.	Operation Research Project on Integrated Energy and Nutrient Supply System, Coimbatore	1,59,000
60.	All India Coordinated Research Project on Acarology, Coimbatore	1,11,000

University Plan Schemes - Animal Science

1.	Department of Animal Disease Investigation and Control, Madras	2,88,000
2.	Department of Clinics, Madras	15,67,600
3.	Cheiron-Making it as Bi-monthly Journal, Madras	30,000
4.	Scheme for Establishment of Radio Isotope Laboratory and Trace Mineral Nutrition, Madras	1,28,500
5.	Scheme for the Establishment of Quality Control and Service Division of Animal Feeds, Madras Veterinary College	1,27,500
6.	Scheme for Strengthening of Bio-Chemistry Section for Research and Teaching of Post-graduate Studies, Madras	53,200
7.	Scheme for Starting of Ph.D., Programme in Therapeutics, Madras	1,12,100
8.	Starting of Ph.D., Programme in Obstetrics and Gynaecology, Madras	5,65,000
9.	Starting of Ph.D., Programme in Pharmacology, Madras	1,42,500
10.	Scheme for Research of Tropical Theileriasis, Madras	1,33,500
11.	Scheme for Research on Electron Microscopical and Ultrastructural Studies on Rhinosporidiosis in Nasal Polyps on Animal and Man, Madras	2,18,000

12.	Strengthening of the Department of Preventive Medicine, Madras	1,43,500
13.	Scheme for Organisation of the Dairy Plant at the Department of Dairy Science, Madras	6,18,000
14.	Scheme for Karyology of Cattle and Buffalo Chromosomes with particular reference to sterility and infertility, Madras	77,700
15.	Scheme for establishment of Vaccine Research Centre, Madras	2,56,900
16.	Establishment of Communication Centre, Madras	70,700
17.	Scheme for Studies on Rumen Physiology, Madras	58,000
18.	Strengthening the Department of Animal Husbandry Statistics, Madras	56,600
19.	Strengthening of the Department of Physiology, Madras	53,000
20.	Strengthening of the Department of Veterinary Pathology, Madras	94,800
21.	Scheme for starting of M.V.Sc., Degree in Dairy Technology, Dairy Microbiology and Dairy Chemistry, Madras	58,200
22.	Scheme for Starting of Radiology Section, Madras	80,200
23.	Establishment of unit for Histology and Histo-Chemistry Department of Anatomy, Madras	74,900
24.	Collaborative Scheme to Increase the Conseption Rate in Frozen Semen Techniques, Madras	1,01,000
25.	Livestock Research Station, Kattupakkam	64,600
26.	Mecheri Sheep Research Station, Pottaneri	2,61,200
27.	Pasture Development Research Project, Pottaneri	1,41,600
28.	University Co-ordinated Research Project on Fodder Crops, Livestock Research Station, Kattupakkam	64,600
29.	Scheme for Enrichment of Poor Quality Cellulosic Waste and Pelleting for Maintenance of Work Bullocks and Cows Yielding less than Five Litres of Milk, Kattupakkam	94,400

30.	Scheme for Strengthening of the Department of Animal Husbandry, Madurai	40,700
31.	Establishment of Institute of Animal Nutrition, Kattupakkam	3,04,200
32.	Scheme for Evolving Broiler Rabbit, Livestock Research Station, Kattupakkam	77,000
33.	Directorate of Animal Health, Trichy	3,32,200
34.	Poultry Research and Development Centre, Pudukkottai	1,60,800
35.	Poultry Research and Development Centre, Namakkal	30,000
36.	Poultry Research and Development Centre, Madurai	1,90,100
37.	Poultry Research and Development Centre, Rajapalayam	1,69,600
38.	Poultry Research and Development Centre, Trichy	2,08,800
39.	Poultry Research and Development Centre, Tiruppur	1,95,700
40.	Poultry Research and Development Centre; Vellore	2,07,900
41.	Livestock Research and Development Centre, Nagarcoil	2,32,100
42.	Livestock Research and Development Centre, Tirunelveli	2,25,500
43.	Livestock Research and Development Centre, Erode	2,19,800
44.	Livestock Research and Development Centre, Dharmapuri	2,11,400
45.	Livestock Research and Development Centre, Thanjavur	1,02,300
46.	Scheme for the Control of Abortion in Cattle	54,500
47.	Scheme for the Control of Abortion in Cattle,Erode	77,100
48.	Farmers' Training Centre, Pudukkottai	2,26,000
49.	Farmers' Training Centre, Kattupakkam	1,99,000
50.	Scheme for Establishment of Regional Sheep Research and Development Centre, Aruppukottai	68,000
51.	Non-Surgical Embryo Transfer in Bovines, Dept.of Obstetrics and Gynaecology, Madras	2,00,000

52.	Scheme for Investigation of Infertility in Breeding Bulls, Dept.of Obstetrics and Gynaecology, Madras	3,00,000
53.	Scheme on Oncogenesis and Etio-pathology and Sinus Tumour in Bovine and Investigation of Epizootiology and Helminthic Diseases,Madras	1,10,600
54.	Scheme for the Central Tissue Culture Laboratory Department of Microbiology, Madras	1,91,700
55.	Establishment of Quality Control Laboratory in Meat and Meat Products, Madras/Namakkal	2,03,900

ICAR Schemes (Animal Science) Fully Financed

1.	Strengthening agricultural research programmes for the socio economic upliftment of tribal area research for buffalo based farming in Nilgiris, Sandynallah	2,00,400
2.	Mineral status of plant and animal and its relation and incidence of Haematurea in hill cattle, SBRS. Sandynallah	72,500
3.	Scheme for evolving broiler rabbit S.R.S. Sandynallah	1,24,300
4.	Scheme for internship in Veterinary,MVC.,Madras	1,00,000
5.	Scheme for processing of animal .wastes (Animal intestines) for the production of sports guts and cat guts and livestock feed supplement, Dept.of Meats, MVC., Madras	1,10,200
6.	Production efficiency of Campbell ducks and their crosses for egg production, P.R.S.,Teynampet	1,89,900
7.	Summer Institute-Recent advances in anaesthetic and surgical Techniques,Dept.of Surgery,MVC., Madras	20,000
8.	Scheme for survey of Animal draught power in various agro climatic zones of the country,the socio-economic features and current husbandry practices, Dept.of Animal Husbandry Economics, MVC., Madras	1,01,496
9.	Scheme for research on utilization of ram semen, Sheep Breeding Res.Station,Sandynallah	77,000
10.	Surveillance of Salmonalla and E.coli infections of poultry and livestock including pet animals and study of contamination by Salmonalla of feedss and other products meant for export and local consumption, Dept.of Microbiology, MVC., Madras	53,400

11.	Scheme for evolving synthetic eggline, Dept.of Animal Genetics, MVC., Madras	1,44,000
12.	Scheme for studies on bio chemical polymorphism, Poultry Research Station, Teynampet, Madras	43,800
13.	Scheme for varient light and dark periods of poultry, Dept.of Poultry Science, MVC., Madras	10,000

ICAR Schemes (Animal Science) Partly Financed

1.	All India Coordinated Research Project on Poultry for Meat, Teynampet, Madras	8,02,000
2.	All India Coordinated Research Project on Sheep for Fine Wool, Sandynallah	7,46,700
3.	AICRP on Sheep Breeding Field Demonstration Unit, SBRS, Sandynallah	62,300
4.	All India Coordinated Research Project for Mutton, Kattupakkam	7,78,300
5.	AICRP on Intracellular Blood protista with particular reference to Immuno prophylaxis and Control. Estt. of a central coordinating Research Unit during VII plan period at TNAU,CBE.	2,17,400
6.	AICRP on determination of the availability of of animal feed resources and their utilization with special emphasis on crop residues to products of industries forest aquatoc and slaughter house in origins and animal organic waste for evolving economic rations of livestock and poultry, MVC., Madras	2,47,800

Fisheries - Plan

1.	Scheme for Culture of Brime Shrimp, Artemia salina, Department of Fishery Biology, Tuticorin	52,600
2.	Scheme for Pollution Monitoring Studies in Tuticorin Waters	47,800
3.	Scheme for Mariculture of Fisheries College, Tuticorin	44,600
4.	Scheme for Brackish Water Pen Culture,Tuticorin	32,300

5.	Scheme for ORP on Fish Cultire, Killikulam	50,000
6.	Scheme for ORP on Fish Culture, TRRI,Aduthurai	38,700
7.	Starting of M.F.Sc. Course Fisheries College, Tuticorin	1,65,300
8.	Scheme for Polyculture of Fin Fishes and Shell Fishes in Brackish Water, Tuticorin	1,14,800
9.	Scheme on Nutrient Chemistry and Proper Utility of Sewages, Tuticorin	64,700
10.	Scheme for Preparation of Certain Smoke Cured Fishes, Tuticorin	85,200
11.	Fish Seed Production Through Induced Breeding, Ambasamudram, Aduthurai, Bhavanisagar and Pondicherry	1,00,000

Govenment of India Schemes

1.	Scheme for cost of cultivation of principal crops - CARDS, Coimbatore	17,56,800
2.	Setting up of Regional Centre for Biogas, College of Agrl.Engg., Coimbatore	4,44,500
3.	National Project on Development of Biofertilizer & Establishment and Multiplication of Blue Green Algae - Dept.of Agrl.Micro Biology,Coimbatore	10,000
4.	Scheme for establishment of rice processing and allied equipments, CAE., Coimbatore	1,15,000
5.	TRYSEM, Krishi Vigyan Kendra, Trichy	29,400
6.	TRYSEM, Krishi Vigyan Kendra, Coimbatore	1,24,300
7.	TRYSEM, AC&RI., Madurai	18,100
8.	Standardisation of development biogas plant components and enriched process techniques for NDC gas output College of Agrl.Engg., Coimbatore	1,50,000
9.	Scheme for evaluation on farm management work at Cauvery Delta, SWRI, Thanjavur	51,000
10.	Scheme for establishment of Plastic Culture Development, CAE, Coimbatore	2,37,800

11.	Scheme on extent of concealed tenancy assessment in Tamil Nadu, CARDS, Coimbatore	73,300
12.	Community Biogas at Salakaraichal, College of Agrl.Engg., Coimbatore	60,000
13.	Scheme on Technology Mission on edible oils, School of Genetics, Coimbatore	1,65,100
14.	Establishment of Regional Centre for fuel efficient stove technology, College of Agrl. Engg., Coimbatore	1,79,400
15.	Comparative studies of sprinkler and drip irrigation methods with conventional surface methods- ARS., Bhavanisagar	2,01,800
16.	Scheme on mechanism of lignocellulose degradation in anaerobia digestar methanogenesis- NPRC, Vamban	3,43,500
17.	Western Ghat Scheme for developing forage grasses, forage legumes and forage trees for hill areas of Palani hills of Western Ghat-HRS, Thadiyankudisai	1,26,800
18.	Western Ghat Development Scheme on exploitation of microbial system associated with plant species in the eco development of Western Ghat region, HRS, Kodaikanal	11,700
19.	Exploitation of microbial system associated with plant species with eco development of Western Ghat region, SBRS., Sandynallah	5,000
20.	Exploitation of microbial system associated with Plant species in the eco-development of Western Ghat region, HRS.,Mettupalayam	16,400
21.	Scheme for research on medicinal plants and tropical pines, FRS, Mettupalayam	5,500
22.	Scheme for research on medicinal plants and tropical pines, HRS, Kodaikanal	17,000
23.	Scheme for nutrient potential studies of soils of Western Ghats and environmental pollution of soils, plants and river water basins, HRS, Kodaikanal	36,800

24.	Scheme for impact of industrial pollution of the ecology of Bhavani River and environs, Dept.of Agrl.Microbiology,Coimbatore	28,000
25.	Scheme for tribes and other communities of Western Ghats their socio cultural and physiological characteristics rehabitation and development in relation to eco-system,HRS,Kodaikanal	11,300
26.	Scheme for tribes and other communities of Western Ghats their socio cultural and physiological characteristics rehabilitation and development in relation to eco-system,SBS, Sandynallah	7,800
27.	Flowering seed and seed quality in forest plantation, forage, vegetable crops as influenced by the agro-techniques and pollutants the ecological balance, HRS, Kodaikanal	11,400
28.	Flowering seed and seed quality in forest plantation. Forage vegetable crops as influenced by the agro techniques and pollutants affecting the ecological balance- FRS., Mettupalayam	11,700
29.	Western Ghat Development Scheme for unit of the integrated eco-development project of Western Ghat-Faculty of Horticulture, Coimbatore	15,500
30.	Scheme for environmental education in the Western Ghat Region, CARDS, Coimbatore	50,900
31.	Principal investigation on exploitation or Microbial degradation,AC&RI., Coimbatore	7,000
32.	Scheme for study on the effects of sea-water intrusion and inwardation on the plant characteristics, TRRI, Aduthurai	96,300
33.	Scheme for survival and effectiveness of rhizobial Inoculants in rice fallow pulses, AC&RI.,Madurai	47,900
34.	Scheme for development of sugarcane Melalathur	54,000
35.	Scheme for development of sugarcane Sirugamani	60,200
36.	Scheme for the development of sugarcane	45,300
37.	Scheme for establishment of Bio-Energy Centre	1,000

Scheme Financed by other Agencies

1.	Scheme for training Women in enterprise Management to encourage their participation in rural development, AC&RI., Madurai (Ford Foundation)	2,60,600
2.	Scheme for training Women in enterprise Management to encourage their participation in rural Development, Fisheries College, Tuticorin (Ford Foundation)	1,94,700
3.	Scheme for training Women in enterprise Management to encourage their participation in rural development, CARDS, Coimbatore	5,000
4.	Scheme for effect of Soil Micro Organisms Dept.of Microbiology, AC&RI., Madurai (International Atomic Agency)	40,000
5.	Scheme for institution of a chair in Agrl.Marketing Management-Director,CARDS,Coimbatore (State Agrl.Marketing Board)	41,100
6.	Project on Credit for rural development in Southern Tamil Nadu - Dept.of Agrl.Economics,AC&RI., Madurai (NABARD)	1,75,000
7.	Scheme for strengthening of Coffee Teaching and Training for U.G. and P.G.Degree in Horticulture, HRS, Yercaud (Coffee Board)	92,500
8.	Scheme for utilization of coir pith as manure in Agriculture Farms-Soil & Crop Management Studies, Coimbatore (Coir Research Institute, Kerala)	1,32,300
9.	Institution of a chair in undertaking experiments on fertilizer use in soil and Crop Management Studies, SCMS, Coimbatore(SPIC Ltd.)	52,500
10.	Establishment of IFFCO Chair-Research in fertilizer use and management-D SCMS,Coimbatore (IFFCO)	54,800
11.	Survey on the production and utilization of horsegram-Regl.Res.Stn.,Paiyur(IDRC)	10,000
12.	Programme of awarding fellowship to women students for P.G.Studies in Agriculture,Coimbatore & Madurai (Ford Foundation)	58,000

13.	Planning for rural future -an experiment, Directorate of CARDS(Ford Foundation)	93,800
14.	Maximisation of yield in rice.Directorate of SCMS, TNAU,Coimbatore (Potash Research Institute)	42,300
15.	International Research Planning workshop on Botanical Pest control in Rice based cropping system,CPPS,Coimbatore (IRRI)	35,850
16.	Scheme on methods for improving productivity in Periyar Vaigai irrigation system,AC&RI,Madurai (Ford Foundation)	44,000
17.	Studies on bobblewith reference to its possible etiology and structural changes on damaged skin-Dept.of Microbiology, MVC,Madras(American Embassy, New Delhi)	6,54,500
18.	Studies in the treated-effluent discharge site of SPIC in Tuticorin Coastal water-Fisheries College,Tuticorin(M/s SPIC)	44,500
19.	Ecological features in the treated effluent discharge site of TAC in Tuticorin, Fisheries College, Tuticorin (TAC)	27,600
20.	Studies on the effect of paper and sugar factory effluents on soil Microflora and Agricultural Cropping Systems-Dept.of Microbiology, AC&RI.,Coimbatore (M/s Seshasayee Paper & Boards Ltd., Erode)	63,500
21.	A study on over exploitation and working of ground water market-WTC,Coimbatore (Ford Foundation)	47,500
22.	Training to seven Vietnamene Scientists in Crop Production and Cotton Crop Protection (CPPS, TNAU)(F.A.O)	3,28,000
23.	Research Programme on sesame-DSG,Coimbatore (IDRC)	20,500
24.	Scheme for research on coleus for Kelkahibi Dept. of Pomology and Olericulture, Faculty of Horticulture,Coimbatore (Hoechst Company-Bombay-10)	33,500

25.	Determinants of selection training needs assessment and training methodology for farm women in six districts of Tamil Nadu, Directorate of CARDS,Coimbatore (DANIDA, Mission)	50,000
26.	Women enterprise-Dept.of Agrl.Economics Directorate of CARDS,Coimbatore(Ford Foundation)	81,000

APPENDIX III

LIST OF BOOKS / BOOKLETS PUBLISHED

English

1. Water Management of Crops under Limited supply
2. Guidelines for Water Management in Sugarcane
3. Study of Saline Soils of PAP - Its Development and Reclamation- A Case Study for Adivalli
4. Abstract of proceedings of National Seminar on Farming Systems for Semi-arid Tropics, March 88
5. Training on Rural Extension Methods for Assistant Conservators of Forests
6. Bulletin on National Seminar on Biogas Technology held in March 1988.

Tamil

APPENDIX IV

List of Research Papers Published

AGRICULTURE

Agricultural Biochemistry

1. Kasthuri, R.M., Jayapragasam, S.R.Sree Rangaswamy, G.Gowri and S.Sadasivam, 1987. Protein and methoinine contents of greengram and blackgram genotypes. TVIS News, 2(2):7-8.
2. Ranganayaki, K., R.Balasaraswathi and S.R.Sree Rangasamy, 1987. Relationship between three Vigna species based on seed proteins (G-1). Genet Agr.,41:437-442.
3. Thayumanavan , B., 1987. Molecular basis for puffing quality of rice. IRRN. 12(4):10.
4. Thayumanavan, B., 1987. Physico chemical properties as a basis for identifying preferred cooking quality. IRRN, 12(4):11
5. Theymoli Balasubramanian and S.Sadasivam, 1987. Changes in starch, oil, protein and amino acids in developing seeds of okra (Abelmoschus esculentus) L Moench. Plant Foods for Human Nutrition 37:41-46.

Agricultural Botany

1. Ananthakumar, C.R. and S.R.Sree Rangasamy, 1987. Combining ability for yield in sesame. Journal of oilseeds research,4(2):28-41.
2. Dhanakodi, C.V., 1986. Genetic divergence in ragi for yield fodder. Madras Agric.J., 73(4):203-207.
3. Dharmalingam,C., and R.N.Basu, 1987. Influence of seed size and seed coat colour on the production potential of Mungbean CO.3. Seeds and Farms.III(5):16-20.
4. Durai R., M.Achuthan, A.Chairmakkani and B.Mahalingam,1987, Coc.85061 - A New early season sugarcane variety for Tamil Nadu. Co-op Sugar,18(11):737-741.
5. Durai R., A.Chairmakkani, M.Achuthan, K.Chinnaswamy and U.Natarajan, 1988. Coc 86062. A promising early season cane for Tamil Nadu. Bharatiya sugar,13(4):69-72.
6. Giridharan, S., G.A.Palanisamy, P.Sivasubramanian and B.Subbulakshmi, 1985. Varietal reaction to earwig (Euborellia stali) in groundnut. Madras Agric.J.,72(11):640.

7. Gomathinayagam, P. and G.Soundrapandian, 1987. Root growth studies on some of the upland rice cultures. Oryza, 24:91-94.

8. Gomathinayagam, P., M.Nagarajan and V.D.Gurusamy Raja, 1986. Studies on the performance of certain upland rice cultures. Madras Agric J., 73(11):645-647.

9. Gomathinayagam, P., G.Soundrapandian and S.Natarajan, 1987. Evaluation of drought resistant upland rice accessions. IRRN, 12 (4):18.

10. Gomathinayagam, P., S.Natarajan and G.Soundrapandian, 1987. Agronomic and yield characteristics of three elite upland rices in Tamil Nadu. IRRN, 12(6):7.

11. Gururajan, B., 1987. Response of different sorghum genotypes for inter cropping with pigeonpea. Sorghum News Letter,29:39-40.

12. Gururajan, B., 1987. Optimising the yield recovery of intercrops in sorghum based intercropping system. Sorghum News Letter, 29:40-41.

13. *Gururajan,B.1987. Intercropping of fodder legumes with sorghum.* Sorghum News Letter, 29:41-42.

14. Kalaimani, S., O.R.Pillai, Wilfred Manual and M.Swaminathan, 1987. TPS-2, A New variety for Kanyakumari. IRRN,12(4):5.

15. Kirubakharan Soundararaj, A.O.M, V.Sivasubramanian and S.Chelliah, 1987. ADT 37 released for Tamil Nadu. IRRN,12(6):6.

16. Krishnadoss, D. and M.Kadambavanasundaram, 1987. Study on heterosis for yield in sesame. Andhra Agric.J.,34(2) 151-154.

17. Kumar, C.R.A. and S.R.Sree Rangasamy, 1987. Dominant dwarf mutants in rice induced with fractionated dose of gamma rays. IRRN, 12(4):5-6.

18. Louis I.H., M.Stephen Dorairaj and Jaquilin Selvaraj, 1986. Induced female sterility in castor. Madras Agric J.,73(1) 643-644.

19. Manivasakam, P., S.Palanisamy, M.N.Prasad, G.Arjunan and R.Appadurai 1986. Development of non-restorer pearl millet lines resistant to downy mildew Madras Agric. J.,73(5):258-282.

20. Marimuthu, R., V.Sivasubramanian and S.Chelliah, 1987. A promising rice culture IET 5656 for shallow waterlogged conditions. IRRN, 12(2):22.

21. Mohammad Sherief, N., R.Appadurai and S.R.Sree Rangasamy, 1986. Growth pattern, heterosis and correlation in sunflower. Madras Agric J., 73(6):308-312.

22. Muralidharan, V., S.R.Sree Rangasamy, R.Rathinasamy, and M.Jeyaprakasam, 1987. Legume-rhizobium interactions:Variations in nodulation in mungbean and their association with plant characters. (Presented at Division of Atomic Energy Symposium on Plant-Microbe interactions held at Uni.Maharani's College, Jaipur-Rajasthan, 11-13, Nov.1987).

23. Muralidharan, V., S.R.Sree Rangasamy, and R.Rathinasamy, 1988. Inheritance of small leaf and crinkled leaf nature in blackgram (Vigna mungo (L) Hepper). Current science,57(8):433-439.

24. Nayagam, P.G., S.Natarajan and G.Soundrapandian, 1987. Agronomic and yield characteristics of three elite upland rices in Tamil Nadu. IRRN,12(6):7.

25. Palanisamy, G.A., K.Natarajamoorthy, and S.Palanisamy, 1987. Performance of CR 606 rice culture. IRRN, 12(3):7.

26. Palanisamy, S., G.A.Palanisamy, K.Natarajamoorthy, and R.Velusamy, 1987. TNAU 80030-a promising rice for Tamil Nadu. IRRN, 12(4):6.

27. Paramasivam, K.S., 1986. Study of heterosis in crosses involving Brown Plant Hopper (Nilaparvatha lugens Stat) resistant rice accessions. Madras Agric.J.,73. 105-111.

28. Paramasivam, K.S., 1986. Study on genotypic and phenotypic variability in hybrids of dwarf and tall Indian rice (Oryza sativa L) Madras Agric.J.,73:411-413.

29. Paramasivam, K.S., 1986. Estimation of heterosis in hybrids and segregating pattern in F2 generation for apiculum pigmentation in spikelets of rice (Oryza sativa L). Madras Agric J.,73: 573-578.

30. Paramasivam, K.S., 1986. Estimation of heterosis in crosses involving saline resistant rice cultures. Madras Agric J.,73: 679-685.

31. Paramasivam,K.S., 1987. Estimation of heterosis in crosses involving brown plant hopper resistant rice accessions. Oryza, 24:166-168.

32. Paramasivam, K.S., and S.R.Sree Rangasamy, 1987. Yield and yield components in high and low yielding Fls and their F2s in rice. Oryza, 24:206-214.

33. Paramathma, M. and M.Balasubramanian, 1986. Correlation and path co-efficient analysis in forage maize. Madras Agric.J., 73(1):6.

34. Ramanathan T., 1987. Breeding approaches to stabilise groundnut yield in Tamil Nadu. Seeds and Farms,13(4) 27-29.

35. Ramanathan,T., 1987. Association of seednut weight with seedlings characters in coconut. Indian Coconut Journal.18(4):3-4.

36. Ramanathapillai, O., S.Kalaimani, G.Radhakumar, A.Idhyarajan, M.Subramanian and A.Sindha Mathar, 1987, TPS-2A-new high yielding rice variety. IRRN,12(6):4.

37. Renganayaki, K., R.Balasaraswathi and S.R.Sree Rangasamy, 1987. Relationship between three Vigna species based on seed proteins (G.1). Genet Agr.,41:437-442.

38. Rangasamy, M., S.R.Sree Rangasamy, K.Natarajamoorthy, and V.Sivasubramanian, 1987. Morphological characters, seed setting and dry matter production of A and B lines. IRRN,12(3), 22-23.

39. Rathinasamy, R., M.Thangaraj and S.R.Sree Rangasamy 1986. Characters limiting productivity in Vigna radiata(L) . Madras Agric.J., 73(6), 433-438.

40. Raveendran, T.S., T.Ramanathan, G.Nallathambi . and H.Vijayaraghavan, 1987. Metrogyph analysis in coconut.Cocos,5:32-38.

41. Sadasivan,R., R.Chandrababu, N.Natarajaratnam, V.Muralidharan and S.R.Sree Rangasamy, 1987. Relative importance of dry matter accumulation and harvest index to yield in mungbean. (International conference of Plant Physiologists of the SARRC countries-Uni.of Gorakpur Dec.20-23,1987).

42. Selvaraj,U ., R.S.Annappan and S.Giridharan, 1986. Co.4-A new high yielding drought tolerant cowpea variety. Madras Agric.J., 73(3):125-128.

43. Selvi N. and Sukanya Subramanian, 1987. Guinea grass-A delicious and non-toxic grass for the livestock. Milcow c2(3):18-19.

44. Selvi B. and S.Palanisamy, 1987. Heterosis for stem sugar and related characters in sorghum. Indian J.Agric Sci., 57(6):423-24.

45. Selvi B., and S.Palanisamy, 1987. Character association in sorghum. Indian J.Agric.Sci.,57(7)488-99.

46. Sevugaperumal, S., G.Soundrapandian and A.Amirtha Deveratnam, 1988. B.G.380-2, A high yielding medium duration variety for Tamil Nadu, IRRN, 13(1):18-19.

47. Shanmugasundaram,P., S.Selvaraj, S.Giridharan, R.S.Annappan and C.K.Rajagopalan, 1986. CO.3. A new bold seeded-Bengalgram variety for Tamil Nadu. Madras Agric.J.,73(2):61-65.

48. Sivasubramanian, V., N.Natarajan, M.Subramanian, and S.Chelliah, 1987. IR 21820. 154-3-2-2-3, a new medium duration rice variety released in Tamil Nadu as ADT.38. IRRN,12(57):5.

49. Soundrapandian G., V.D.Guruswamy Raja, M.Kadambavanasundaram and P.Rengaswamy, 1987. A cold tolerant rice variety MDU 2 for cumbum valley of Madurai district. Madras Agric.J., 72(12): 661-66.

50. Sree Rangasamy, S.R., G.A.Palanisamy, K.Natarajamoorthy, S.Palanisamy, P.Velusamy and S.M.Lal, 1987. IR.64 compared with recently released ASD.16 and other IR varieties. IRRN, 12(3):5.

51. Subbulakshmi, B and V.Subramaniam, 1986. Effect of environment in the variability of characters in safflower (Carthanus tinctorius. Madras Agric.J.,73(8):450-546.

52. Subramanian, M., K.Ganesan, W.W.Manual and T.Sundaram, 1987. Seedling tolerance for dehydrating wind. IRRN,12(2):22,23.

53. Subramanian, M., A.P.M.K. Soundararajan and V.Sivasubramanian, 1987. Performance of broadcast seeded TM 8089. IRRN,12(3):8.

54. Subramanian, M., V.Sivasubramanian and G.S.Kush, 1987. Performance of medium duration IRRI lines in Tamil Nadu . IRRN,12(1).

55. Sukanya Subramaniam (1987) Cynodon dactylon (L) Tmil Eucyclopaedia-Part II. Tamil University Publication, Thanjavur 63:2: 626-628 (May, 1987).

56. Thiagarajan, K., G.Arjunan, G.Vijayakumar, K.S.Jehangir and R. Rathnaswamy, 1987. Reaction of Arhar (Pigionpea) coordinated trial lines to sterility mosaic in Tamil Nadu. International Pigeonpea News.1.,7:53-54.

57. Velusamy, R., K.Natarajamoorthy, G.A.Palanisamy, and S.Palanisamy, 1987. Resistance to thrips of traditional rice cultivars. IRRN, 12(2):19.

58. Velusamy, R and K.Natarajamoorthy 1987. Sources of resistance to rice thrips. IRRN, 12(6):13.

59. Velusamy, R., G.A.Palanisamy, and K.Natarajamoorthy, 1987. Hill rice resistance to leaf hoppers and plant hoppers in Tamil Nadu. IRRI, 1292):19.

60. Vivekanandan,P., T.B.Ranganathan, and M.Kadambavanasundaram 1987. Susceptibility of rice hybrids to blast (B1). IRRN,12(1):6-7.

61. Vindhiya Varman P. and A.Arjunan 1987. Segregation of chlorophyll in intraspecific crosses of groundnut. J.Oilseeds Res., 4:223-226.

62. Vindhiya Varman, P.,R.Rathnaswamy, R.Sethupathi Ramalingam and M.Vaman Bhat, 1986. Inheritance of growth habit in groundnut. Madras Agric.J., 73:299-300.

63. Vindhiya Varman,P. R.Rathinaswamy, R.Sethupathi Ramalingam and M.Vaman Bhat, 1986. Inheritance of inflorescence types in groundnut. Madras Agric.J., 73:719-720.

Agricultural Economics

1. Ajjan, M., 1987. Production, Consumption and Export Performance of Tea in World and India. TAI Newsletter,23(3):10-15.

2. Ajjan, N., 1987. An Analysis of Changes in Area, Productivity and Production of Tea in India, North India and South India since 1950-51 to 1984-85. TAI Newsletter,24(3)5-9.

3. Alagumani, T. and V.Meenakshisundaram, 1987. Crop Planning under Changing situation of Electricity supply in Farms. Rural Development Review,6(3) & (4):626-631.

4. Meenakshisundaram, V., R.Sundaresan, R.Venkataram and M.Chandrasekaran,1987. An Economic Analysis of Production of Betelvine in Tamil Nadu. Agricultural Situation in India, 42(9):807-810.

5. Shumway, C.R., K.Jegasothy and Willian Alexander, 1987. Production Interrelationship in Srilankan Peasant Agriculture. Australian Journal of Agricultural Economics,31(1):54-58.

6. Sundaresan,R., and M.Chinnadurai, 1987. An Inter-Industry Analysis of Different Sectors in Thanjavur District. Rural Development Review, 6(1&2): 542-551.

7. Varadarajan,S., How to improve Agricultural Marketing System. Rural Development Review,6(1&2):525-527.

Agriçultural Entomology

1. Balamurugan P., S.Thirumurthy, C.Udayasooriyan and A.Chamy, 1987. Pests of sunflower seeds in storage .Seeds and Farms, 12(7): 31-32.

2. Balasubramanian,G., M.Balasubramanian,S.Jayaraj and S.Venkatesan, 1986. Varietal screening of rice for resistance to stem borer, Setiroophaga incertulas Walker. Madras Agric.J.,73(7):361-365.

3. Balasubramanian, G., M.Balasubramanian, K.Sankaran and T.S.Manickam, 1986. Effect of fertilization on the incidenc of shootfly and stem borer on rainfed sorghum. Madras Agric.J.,73(8):471-473.

4. Balasubramanian, G., S.Jayaraj and M.Balasubramanian, 1987. Effect of slow release fertilizer nitrogen and neem products on the control of stem borer in rice. Indian J.Plant Prot.,15:132-135.

5. Bharathi, M., M.S.Venugopal and S.Chelliah, 1987. Sources of resistance in rice to BPH, Nilaparvata lugens.Annu.pl.Res.Insects Newsl., 13:56.

6. Chandrasekaran,J. and N.R.Mahadevan, 1987. A note on the performance of hand operated ULV sprayer for the control of groundnut leaf miner.J.Oilseeds Res. 4:139-140.

7. Dhandapani, N., 1986. Consumption, digestion and utilization of bhendi varieties by Earias vittella E.Madras Agric.J.,73(12): 676-678.

8. Dhandapani, N., and A.Abdul Kareem, 1986. Evaluation of poison bait for the red hairy caterpillar. Pestology 10(11):8-10.

9. Dhandapani, N., A.Abdul Kareem and S.Jayaraj, 1987. Studies on poison baiting for the tobacco caterpillar, Spodoptera litura. ENTOMON,12(3):223-226.

10. Dhandapani, N., A.Abdul Kareem and S.Jayaraj, 1987. Studies on use of colour cloth to trap cotton leaf worm, Spodoptera litura (Noctuidae : Lepidoptera). Cotton Development,15(4):11-12.

11. Dakshinamoorthy, A., P.Karuppuchamy and M.Mohanasundarm, 1987. Occurrence of the parasitic mite, Pyetotoes ventricosus (Newoort) or Sitotroga cereallella Oiliv. IRRN,12(4):42.

12. Durairaj.C., M.Gopalan, K.Gunathilagaraj and P.C.Sundarababu, 1987. Relative incidence of thrips in certain rice varieties. Ann plant Res. Insects Newsl.,13:52.

13. Eswaramoorthy, S. and S.Jayaraj,1987. Survey of granulosis virus infection in sugarcane borer, Chilo infuscatellus Snellen and C.sacchariphagus in dicus (Kapur) in India. Tropical Pest Management, 33:200-201.

14. Gopalan,M., N.C.Radha and G.Balasubramanian, 1987. Screening rice varieties for resistance to mealy bug. IRRN,12(4):18.

15. Gopalan,M., N.C.Radha and G.Balasubramanian,1987. Effect on insecticides on eggs of Brevennia rehi Lindinger. IRRN,12(4):35.

16. Gopalan, M., N.C.Radha and G.Balasubramanian, 1987. Biochemical changes in rice plants infested with mealy bug. IRRN, 12(4):45.

17. Gopalan, M., R.Madusudhan and G.Balasubramanian, 1987. Effect of Juvenoids on Spodoptera litura Fabricius. IRRN,12(4):33.

18. Gunathilagaraj,K. and P.C.Sundara Babu, 1987. Mycosis of Nilaparvata lugens (stal) from India. Curr.Sci.56(2):1424-1425.

19. Gunathilagaraj, K. and T.Kumaraswamy, 1987. Resistance in Okra, Abelmoschus esculantus (L) Moench to the red spider mite, Tetranychus cinnbarinus (Boisduval). Ann.plant Res.Insect. Newsl., 13:48-49.

20. Jaganathan, S. and M.S.Venugopal, 1986. Ovipositional behaviour of rice gall midge. Oryza, 24(2):160.

21. Jayaraj.S. and A.V.Rangarajan, 1987. Trends in insect control-Post-pyrethroids. Pesticides,21(1): 11-25.

22. Joshi, R.C., E.A.Heinrichs and S.Uthamasamy,1986. A bibliography on Hydrellia spp. attacking rice. FAO Asia Pac. Pl. Prot.comm.Quart.Newsl.29(2): 30-44.

23. Joshi, R.C. and M.S.Venugopal, 1987. Cecidogenesis and leaf sheath pigmentation. Sci. & Cul., 53:186-187.

24. Kalaimani, N., T.S.Unnikrishna Nair and M.Mohanasundaram, 1987. Incidence of arthropods in dried fish products. Fishery Technology, 24(2):93-95.

25. Karuppuchamy, P., N.Dhandapani, P.C.Sundara Babu and M.Mohanasundaram, 1986. Efficacy of certain acaricides for the control of carmine spider mite, Tetranchus cinnabarinus (Boisduval) on Jasmine. Madras Agric.J.,7(4):236-239.

26. Karuppuchamy, P., S.Uthamasamy and N.Ganesh Kumar, 1986. Chemical control of pests in rice fallow cotton in cauvery deltaic region, Madras Agric.J.,73:178-180.

27. Karuppuchamy, P. and M.Gopalan, 1986. Influence of time of planting on the incidence of rice pests. Madras Agric.J.,73:606-609.

28. Karuppuchamy, P. and M.Mohanasundaram, 1987. New species and records of Tetranychid mites (Tetranychidae:Acari) from India. Entomon, 12(2):89-94.

29. Karuppuchamy, P., and M.Mohanasundaram, 1987. Bioecology and control of chilli muranai mite,Polyphagotarsonemus latus (Banks) (Tarsonemidae : Acari). Indian J.Pl.Prot.15:1-4.

30. Karuppuchamy, P., R.Velusamy, R.Rajendran and P.C.Sundara Babu, 1987. Rice mite, Oilgonychus Oryzae (Hirst) incidence on IR elite lines. IRRN, 12:10.

31. Logiswaran, G., V.K.R.Sathiyanandam, M.S. Venugopal and P.C.Sundara Babu, 1987. Screening rice cultures for resistance to gall midge, Orseolia oryzae. Annu.Pl.Res.Insects Newsl.13:50.

32. Logiswaran,G., C.Durairaj and P.C. Sundara Babu, 1987. Effect of insecticides on rice gall midge and its parasites, platygaster sp. IRRN, 12(6):31.

33. Logiswaran,G., V.K.R. Sathiyanandam and P.C.Sundara Babu, 1988. Economics of rice gall midge (GM) in resistant and susceptible varieties. IRRN,13(1): 32-33.

34. Logiswaran, G., V.K.R. Sathiyanandam, K.Ramaraju and P.Sundara-Babu, 1987. Reaction of rice culture seedlings to thrips. IRRN, 12(2): 19.

35. Mahadevan N.R. and M.Mohanasundaram, 1986. Field evaluation of insecticides for their efficacy in the control of leaf webber and gall midge on sesame. Oilseed Crops Newsletter,3:47-48.

36. Mahadevn, N.R., 1987. Evolving spray schedule for the control of sesame pests. Oilseed Crops Newsletter,4:84-86.

37. Manidurai Manoharan David. P., 1986. Effect of slow release nitrogen fertilisers and of foliar application of neem products on rice pests. Madras Agric.J.,73(5):274-277.

38. Manoharan, T. and N.Chandramohan, 1986. Psoralia corylifolia, an alternate host for carry over of groundnut leaf miner, Aproaerema modicella. Madras Agric. J.,73(10):591.

39. Mohan, S., and P.Karuppuchamy, 1987. A potential preadator for sorghum mite, Oligonychus indicus(Hirst). Curr.Sci.56:845-846.

40. Mohan, S., D.Purushothaman, S. Jayaraj and A.V.Rangarajan, 1987. Can the use of Azospirillum control shootfly., Curr. Sci., 55:932-938.

41. Mohan, S.,D.Purushothaman, A.V.Rangarajan and S.Jayaraj, 1987. Azospirillum seed inoculation reduces shootfly incidence in sorghum. Curr.Sci.14,723-725.

42. Narayanan, K., S.Jayaraj and T.R.Subramanian, 1987. Absorption of polyhedra of a nuclear polyhedrosis virus. H.armigera in two different types of soils. Insect. Sci. Applic., 8(1): 53-56.

43. Natarajan,M., P.C. Sundara Babu and Philip Sridhar, 1987. Screening sorghum lines resistant to earhead bugs. Calocoris angustatus Lethierry Ann plant Res. Insects.Newsl.,13:52-53.

44. Natarajan, K., M.S.Venugopal and S.Chelliah, 1985. BPH outbreak in Thanjavur district, Tamil Nadu. IRRN, 13(1):26.

45. Padmanabhan, M.D. and J.Raja, 1987. Pests of sugarcane and their intensity in North Arcot district. Tamilnadu Co-op Sugar, 19(3).

46. Rabindra, R.J., 1988. Changes in proteins, free amino acids, nucleic acids, total lipids and free fatty acids in larvae of Tribolium castaneum due to Farinocystis tribolii infestation. J.Biol.Control. 1:48-52.

47. Rabindra, R.J. and S.Jayaraj, 1987. Histopathology of nuclear polyhedrosis virus with simultaneous parasitisation in Chrysodeixis chalcyter (Esp.) with Distomartix sp. Curr. Sci., 56(23):1241-42.

48. Rabindra, R.J., M.Gopalan and R.Velusamy, 1987. Rice varieties resistant to brown planthopper, white backed planthopper and leaf folder. IRRN, 12(5): 12.

49. Rajasekaran, B., R.Rajendran, R.Velusamy and P.C.Sundara Babu, 1987. Effect of vegetable oils on rice leaf folder feeding behaviour. IRRN, 12(2): 34.

50. Rajendran, R. and M.Gopalan, 1987. Composition of the rice leaf folder complex in Coimbatore, Tamil Nadu, India. IRRN, 12(6): 26.

51. Rajendran, R. and S.Chelliah, 1987. Effect of eight insecticides on rice bug eggs. IRRN, 12(4): 42.

52. Rajendran, R., and R.Velusamy, 1987. Screening rice accessions against leaf folder (LF), Cnaphalocrosis medinalis. IRRN, 12(4):17.

53. Raju, M., R.Saroja and M.Suriachandraselvan, 1988. Compatible insecticides and fungicides to control rice leaf folder and sheath rot. IRRN, 13(4).

54. Ramarajulu, K, and P.C.Sundara Babu, 1987. Varietal resistance to rice varieties to WBPK. Ann plant Res. Insects Newsl.,13:52.

55. Ramasubramanian G.V. and P.C.Sundara Babu, 1987. Screening of cowpea accessions to the spotted pod borer, Maruca testulalis (Geyer). Ann plant Res. Insects Newsl. 13:57.

56. Ramasubramanian, G.V., and P.C.Sundara Babu, 1987. Ovipositional preference of inflorescence of redgram, cowpea and lablab by Maruca testulalis (Geyer). Ann Plant Res. insects Newsl, 13:47-48.

57. Saroja, M. Suriachandraselvan and N.Raju, 1987. Multiple resistanc of B.G. 367-3 to major insect pests and diseases. IRRN,12(1).

58. Saroja, R. and M.Suriachandraselvan, 1987. Field evaluation of rice cultures resistant to leaf folder and sheath rot. IRRN,12(2).

59. Saroja, R., R.Jaganathan and N.Raju, 1987. Effect of 'N' nutrition and rice variety on leaf folder and yellow stem borer and grain yield. IRRN, 12(5).

60. Sathiyanandam V.K.R., G.Logiswaran and P.C.Sundara Babu, 1987. Sources of resistance to rice stem borer Tryporyza incertulus (wek) in the nursery. Ann Plant Res .Insects Newsl.13:50.

61. Sathiyanandam, V.K.R., G.Logiswaran and P.C.Sundara Babu, 1987. Screening of rice cultures against thrips stenchactothrips biformis (Bagnall) in the nursery. Ann Plant Res. Insects Newsl.,13:50.

62. Sathiyanandam, V.K.R., M.S.Venugopal, G.Logiswaran, P.C.Sundara Babu and M.Gopalan, 1987. Efficacy of insecticidal seed treatments against thrips. Rice Res. Newsl.,8(1):2-3.

63. Sellammal Murugesan, M.S. Venugopal and M.Bharathi, 1987. Rice thrips control in the transplanted crop at tillering stage. IRRN, 12(5):25.

64. Sellammal Murugesan, S. Chelliah and A.Subramanian, 1987. Influence of weather factors on the population dynamics of green leafhopper, Nephotettix virescens. Indian J.Agric.Sci. 73 (8): 467-70.

65. Sivaprakasam, N., C.Balasubramanian, S.Venkatesan, V.Jayaraman and A.Narayanan, 1986. Effect of host plants on parasitism by parasitoids of H.armigera Hubner. Madras Agric.J.73(8): 467-70.

66. Sivaprakasam, N., G.Balasubramanian, S.Venkatesan and A.Narayanan, 1986. Low temperature storage of Eucelatoria bryani Sabrasky. Madras Agric. J., 73(9).

67. Sivaprakasam, N., G.Balasubramanian, S.Venkatesan and A.Narayanan, 1986. Subsceptibility of Tachinid parasites, Eucelatoria bryani. Sabrosky and Corcelia illota Curran to different insecticides. Madras Agric. J.,73(10: 561-565.

68. Sivaprakasam, N., G.Balasubramanian, V.Jayaraman, A.Narayanan and S.Venkatesan, 1987. Field recovery of Eucelatoria bryani on Heliothis armigera. Madras Agric J.,73(11):614-617.

69. Sivaprakasam, N., G.Balasubramanian, S.Venkatesan, V.Jayaraman and A.Narayanan, 1987. Effect of host plants on parasitism by parasiticides of Heliothis armigera Hubner,. Madras Agric.J., 73(8) 468-470.

70. Sivaprakasam, N., G.Balasubramanian, S., Venkatesan and N.Narayanan, 1986. Susceptibility of tachnid parasites Eucelatoria bryani. Sabrosty and Carcelia illota. Curran to different insecticides. Madras Agric.J. 73(10):561-565.

71. Shivaraj, K., M.Bharathi and S.Chelliah, 1987. Evaluating rice varieties for resistance to GLH, Nephotettix virescens. Annu.pl. Res.Insects Newsl., 13:56.

72. Sridharan, S., S.Seemanthini Ramadas, A.Azuez Basha and S.Syed 1987. Preliminary studies on the susceptibility of different types of cardamom to stem borer Dichorosia punctiforlis in Shevroys. Cardamom, 20(11).

73. Subramanian, M., and M.Velusamy, 1987. Reaction of rice varieties to thrips. IRRN, 12(2): 18.

74. Sundara Babu P.C. and R.Rajendran, 1988. Screening of rice varieties for resistance to brown planthopper and leaf folder. Madras Agric J., 73:297-298.

75. Sundara Babu, P.C. and R.Rajendran, 1987. Evaluation of rice varieties for resistance to BPH and leaf folder. Annual Plant Resistance to Insects Newsletter,13:45-46.

76. Sundararajan, D., D.Kalaichelvan and A.V.Rangarajan, 1986. Control of redgram pod borers with insecticidal dust. Pestology 10(3): 17-18.

77. Suriachandraselvan, M., J.Venkatakrishnan, K.Nilakantapillai and T.B.Ranganathan, 1987. Field screening for blast (B.L) resistance. IRRN, 12(2).

78. Swamiappan, M., C.S.Deivavel and S.Jayaraj, 1987. Mode of action of activated kaolin on the pulse beetle, Callosobruchus chinensis. Madras Agric.J.,73:576-578.

79. Thirumurthy, S., and A.Chamy, 1987. Annotated list of the pests of stored seeds. Seeds & Farms,12(4):42-43.

80. Thirumurthy, S., and A.Chamy, 1987. Pests of pulse seeds and their control. Seeds and Farms,12(5):23-26.

81. Thirumurthy, S., and P.V.Balashanmugam, 1987. Birds associated with fruiting cashew trees. The Cashew.1:18.

82. Velusamy M., D.Alice and M.Subramanian, 1987. Reaction of rice varieties to mites Oligonychus oryzae. IRRN, 12(3):15.

83. Velusamy, M., D.Alice and M.Subramanian, 1987. Screening rice cultures against rice whorl maggot (RWM). IRRN,12(3):17.

84. Velusamy, M., and M.Subramanian, 1987. Control of rice pests with phosphamidon 85% W.P. IRRN,12(3):29.

85. Velusamy, R., 1987. Wild rice resistance to brown plant hopper. IRRN, 12(2):21.

86. Velusamy, R., K.Natarajamoorthy and G.A. Palanisamy, 1987. Hill rice resistance to leaf hoppers and plant hoppers in Tamil Nadu. IRRN, 42(2):19.

87. Velusamy, R., K.Natarajamoorthy, G.A. Palanisamy and S.Palanisamy, 1987. Resistance to thrips on traditional rice cultures. IRRN, 12(2):19.

88. Velusamy, R., R.Rajendran and P.C.Sundara Babu, 1987. Effect of three neem products on brown plant hopper oviposition. IRRN,12(2):36.

89. Velusamy, R., P.C.Sundara Babu, K.Natarajamoorthy, G.A.Palanisamy and S.R.Sree Rangasamy, 1987. Resistance to brown plant hopper in wild rices. Ann Plant Res. Insects Newsl.,13:44.

90. Vennila, S., and P.C.Sundara Babu, 1987. Screening of rice entries for resistance against leaf hopper Nephotettix virescens (Distant). Ann Plant Res.Insects Newsl.,13:46-47.

91. Vennila, S., and P.C.Sundara Babu, 1987. Species composition of Nephotettix in TamilNadu.IRRN,12(6):29.

92. Venugopal, M.S., 1985. Problems and priorities in the management of rice gall midge. Cedidol.Int.,6(1-3):97-99.

93. Venugopal, M.S., and S.Chelliah, 1987. Screening of rice varieties for resistance to the leaf folder, Cnaphalocrocis medinalis. Annu.Pl.Res.Insects Newsl.,13:57.

94. Uthamasamy, S. and P.Karuppuchamy, 1986. Management of rice gall midge, Orseolia oryzae (Wood-Mason) with reference to time of planting and varietal resistance. Madras Agric.J.,73: 146-150.

Agricultural Extension and Sociology

1. Nanjaiyan, K., and A.John Knight, 1987. Information source contact of small rice growers. Rural Deve. Review, 6(1&2):564-572.
2. Perumal, G. and V.R.Sridhar, 1986. Impact of farm telecast programme on rural televiewers. Rural Dev.Review,5(1&2).
3. Perumal, G. and V.R.Sridhar, 1986. Influence of socio economic characteristics of rural televiewers on the impact of farm telecast. Rural Dev.Review,5(3 & 4).
4. Perumal, G., 1986. Under graduate training in Extension Education-Prospects and retrospects. Indian Journal of Extn.Edn.,XXII(3&4).
5. Vijayaraghavan, R., 1986. A critical note on farmers' credit need. Rural Dev.Review, 5(1&2):479.
6. Vijayaraghavan, R., and Y.P.Singh,1986. Sociological background of Indian farm scientists. Rural Dev.Review,5(3&4):521.
7. Vijayaraghavan, R., 1987. Farmers' credit need. Rural India,Oct-Nov., 1987:194.

Agricultural Microbiology

1. Anthoni Raj, S., V.Udayasuriyan, M.Sahul Hameed and S.R.Sree Rangasamy, 1986. Nodulation status of certain legumes in Coimbatore soil. Madras Agric.J.,73:414-417.
2. Gunasekaran, S., N.Meyyazhagan and D.Purushothaman, 1987. Response of fodder oats to *Azospirillum* inoculation.Sci. and Cult.,52:399-400.
3. Kannaiyan, S., 1987. Influence of temperature on growth and nitrogen fixation by *Azolla* spp.Phykos,16:134-139.
4. Kannaiyan, S., 1987. Effect of Benlate on the germination of *Azolla mexicana* megasporocarps. Curr.Sci.,56:490-491.
5. Kumar, K. and A.Balasubramanian, 1986. Field response of rice to *Azospirillum* biofertiliser. Curr.Res.,15:74-76.
6. Pandiarajan, P. and A.Rajamannar, 1988. Effect of blue green algae (BGA) inoculation and urea super grannules(USG) on rice yield in sodic soils. IRRN,13(1) 20.
7. Murugesan, R. 1987. Fertilizer effects in soybean. Biology Education, 4:48-50.
8. Murugesan, R., M.Sahul Hameed,S.Anthoni Raj and G.Oblisami, 1986. Rice *Kanji* as an effective sticker for rhizobial inoculation. Madras Agric.J.,73:294-297.

9. Purushothaman, D., R.Jambulingam and S. Kannaiyan, 1986. Root nodulation in Acacia holosericea - An introduced tree species from Australia. Nat. Sci. Acad. Sci. Lett.,9(5): 129-131.

10. Rajasekaran, P. and R.Murugesan, 1986. Methane production from cowdung incorporated starchy wastes. Madras Agric. J., 73: 115-116.

11. Rangarajan, M. and P.Muthukrishnan, 1988. Nitrogen fixing activity of Azotobacter chroococcum in terms of grain yield under puddled rice culture system having various substrates. Arch. Hydrobiol. Beih. Ergebh Limnol. 31:345-351.

12. Rangarajan, M. and A.S.Purushothaman, 1987. Successful inoculation of Vigna radiata (L) Wilczek grown in rice fallow soil containing indigenous cowpea rhizobia. FEMS Microbiol. Ecol., 45: 85-88.

13. Subramani, S. and S.Kannaiyan, 1987. Effect of incorporation and unincorporation of Azolla biofertilizer on the grain yield of rice. J.Agron. Crop. Sci., 159:308-311.

14. Sukumar, D. and S.Kannaiyan, 1987. Effect of sodium chloride on growth and nitrogen fixation in Azolla.J.Curr Biosci. 4:71-76.

15. Venkataraman, S. and S.Kannaiyan, 1988. Influence of Azolla inoculation and double row planting on rice. J.Basic & Appl. Microbiol, 1:15:20.

Agronomy

1. Balasubramanian, P., A.Sheik Dawood and S.Sankaran, 1987. Effect of basally applied coated urea on grain yield; IRRN,12(3):48.

2. Balasubramanian, P. and Dawood, 1987. Performance of long duration CR 1009 with aged seedlings. IRRN,12(4):59.

3. Budhar, M.N., K.N.Chinnasamy, N. Gopalsamy, and P.Muthusamy, 1986. Response of groundnut to different levels of phosphorus under irrigated condition. Madras Agric. J., 73(1):57-58.

4. Devaraj, G. and V.S.Shanmugasundaram, 1987. Effect of spacing, sett types, seed rates, system of planting and N levels on growth characters of sugarcane variety Coc. 671. Bharatiya sugar,12(4): 45-52.

5. Devaraj, G. and V.S.Shanmugasundaram, 1987. Increasing cane sugar yield at reduced cost of cultivation in the variety COC 671. Cooperative Sugar,18(7):467-469.

6. Kamala Thirumalaiswamy, R.Sathasivam and N.Natarajaratnam, 1986. Effect of sulphur utilisation on nutrient content, dry matter production and yield of groundnut. Madras Agric.J.,73.(3):151-154.

7. Korikanthimath, V.S., and SP.Palaniappan, 1987. Correlation of 'N' content in plant at various stages of crop growth with grain yield in sorghum,J.Maharashtra Agric.Univ.,12(1):140.

8. Latha, K.R. and S.Subramanian, 1986. Response of rice to fertiliser nitrogen and Azolla and its economics. Madras Agric.J.,73(11):622-626.

9. Latha K.R. and S.Subramanian, 1986. Effect of fertiliser nitrogen and Azolla on rice. Indian J.Agron.,31(4) 387-389.

10. Murugappan, V., R.Nagarajan and S.Subramanian, 1988. A new proposal for fertiliser recommendation to crops. Fert.News.,Feb.88: 9-17.

11. Nallathambi, G., T.S.Raveendran, and T.Ramanathan, 1988. Production costs and returns on coconut cultivar, East Coast Tall in Tamilnadu. Indian Coconut J., 18(10:13-18.

12. Nasir Ahmed, S., S.Jothimoorthy and K.Rajagopalakrishnan, 1987. Studies on the effect of neem cake blended urea on cane yield and quality. Bharatiya sugar,13(2):35-36.

13. Nasir Ahmed, S., and S.Jothimoorthy, 1987. Effect of Sencor on weed growth, growth characters, yield and yield components and quality of cane. Indian Journal of sugarcane technology,1(4): 83-85.

14. Parameswaran, P., T.Ramanathan and T.Senthivel, 1987. Moisture conservation techniques for rainfed groundnut,sunflower and sesamum. Seeds and Farms, 13(3):41-45.

15. Palaniappan, SP., 1987. Top dress application of potash increases rice yields in India. Better Crops International,3(1):6-8.

16. Prasad, R. and SP.Palaniappan, 1987. Pulse crop residue as 'N' source in rice based cropping system, IRRN,31.

17. Rajagopalan, S., and J.Krishnarajan, 1987. The effect on rice yield of nursery treatments at various levels of main field phosphorus. IRRN, 12(5) 33.

18. Rajagopalan, S., and M.Subramanian, 1987. Integrated nutrient management for short duration rice. IRRN,12(5):33-34.

19. Rajagopalan, S., and M.Subramanian, 1987. Integrated nutrient management for short duration rice. IRRN,12(5):33.

20. Rajaram, S., K.V.Selvaraj and V.Subramanian, 1986. Optimum stage of harvest for cumbu 4 (Pearl millet). Madras Agric.J., 73:588.

21. Ramanathan, T., 1987. Technology for increasing coconut production in Tamil Nadu. Indian Coconut Journal, 17(10):3-8.

22. Ramaswami, C., 1988. Metribuzin, an useful herbicide in sugarcane fields. Pesticides:21-22.

23. Ramaswamy, S., B.Chandrasekaran and S.Sankaran, 1987. Effect of spacing and seedlings per hill. IRRN 12(4):49.

24. Ramasamy, S., S.Sankaran and V.Velu, 1987. Split application of slow release urea. IRRN, 12(2):41.

25. Robinson, J.G., T.N.Balasubramanian and V.Ravikumar, 1986. Effect of different moisture conservation systems on the yield of sorghum (CSH 6) in rainfed vertisols. Madras Agric.J.,73(5): 255-258.

26. Shanthi, S.R. and SP.Palaniappan, 1987. Effect of neem leaf application on nitrogen efficiency in low land rice. IRRN,29.

27. Siddeswaran, K. and C.Ramaswami, 1987. Intercropping and border cropping of compatible crops in finger millet under garden land cultivation. J.Agronomy and Crop Science,178: 246-249.

28. Velayudam, K and Jagdish Seth, 1986. Effect of Preceding Crops on growth, 'N' concentration and uptake in Wheat. Indian J.Agron., 31(4):358-361.

29. Vijayaraghavan H., T.S.,Raveendran, and T.Ramanathan, 1988 Influence of weather factors on yield of rainfed coconut. Indian Coconut J., 18(9): 1-3.

Crop Physiology

1. Arjunan, A. and S.Gopalakrishnan, 1987. Cationic content of groundnut shell as influenced by calcium-sodium interaction. Madras Agric.J.,73(2):84-88.

2. Balakrishnan, K., K.M.Sundaram, N.Natarajaratnam and C.Rajendran, 1988. Prediction of drymatter accumulation through non-destructive methods in papaya (Carica papaya). Indian J.Agric.Sci.,58:74-75.

3. Balakrishnan, K., K.M.Sundaram and N.Natarajaratnam, 1987. Leaf area estimation by non-destructive method in blackgram. Indian J.Agric.Sci.,57:286-288.

4. Balakrishnan, K., N.Natarajaratnam and C.Rajendran, 1987. Influence of sowing date on photosynthesis and production of cajan (L) Millsp. Photosynthetica, 21(3):308-313.

5. Durga Devi. D., K.M.Sundaram, and N.Natarajaratnam, 1987. Productivity of rainfed sorghum-A physiological analysis. J.Agron.Crop Sci., 159:360-364.

6. Srinivasan, P.S., R.Sadasivan, A.Arjunan, R.Sethupathy Ramalingam and Vaman Bhat, 1987. Effect of water stress on partitioning of dry matter and crop growth rate in relation to productivity in groundnut cultivars. J.Oilseeds Res.,4:89-96.

7. Sundaram, K.M., M.Moosa Sheriff and N.Natarajaratnam, 1988. Moisture stress and flowering behaviour in groundnut (paper presented in the International congress of plant physiology, New Delhi. February 15-20).

8. Vanangamudi, K., K.M.Sundaram, Mallika Vanangamudi, K.Balakrishnan and N.Natarajaratnam, 1987. Influence of moisture stress at critical stages of crop growth on seed quality of groundnut cultivars. J.Oilseeds Res.,4:9-12.

9. Vindiyavarman, P., and A.Arjunan, 1987. Segregation of chlorophyll deficiency in intraspecific crosses of groundnut. J.Oilseeds Res.,4:223-226.

10. Thandapani, V., and J.Sekharam Rao, 1986. Significance of dry matter production of greengram (Vigna radiata (L) wikzek) genotypes in relation to yield. Madras Agric.J.,73(4) 188-192.

11. Thandapani, V., and M.Subbarayalu, 1986. Effect of pre-sowing seed treatment with chemicals and growth regulators for drought tolerance and yield of cotton (Gossypium hirsutum L) under rainfed condition. Madras Agric.J.,73(12):668-675.

Food Science and Nutrition

1. Banumathy, P.,S.Neelakandan and R.Malathy, 1987. Improved Method of collecting Neera. Ind.Coconut J.,18(5):1.

2. Banumathy, P., and S.Neelakantan, 1986. Why breast milk is best milk. Home. Sci.,24(9):4.

3. Jayalakshmi, N and S.Neelakantan, 1987. Studies on the acceptability of sorghum-Soya blends in South Indian dishes and their keeping quality. Ind.J.Nutr Diet.,24:136.

Nematology

1. Jonathan, E.I., and B.Velayutham, 1987. Evaluation of yield loss due to rice root rot nematode, Hirschmaniella Orybal.Int Nematology Network News,4(4):8-10.

Plant Pathology

1. Alagarsamy, G., and R.Bhaskaran, 1986. Effect of Time of application of nitrogen and potassium in combination with nutrients and fungicide spray on sheath rot incidence and grain yield of rice. The Philippine Agriculturist 69(1) 99-105.

2. Alagarsamy, G., 1986. Effect of nutrients on sheath rot incidence and grain yield of rice. Madras Agric.J.73(2)117-118.

3. Alagarsamy, G., and R.Jayarajan, 1986. Efficacy of fungicides against grey mildew disease of cotton. Madras Agric.J.73(11) 651-652.

4. Alagarsamy, G., S.Mohan and R.Jeyarajan, 1987. Effect of seed pelleting with antagonists in the management of seedling disease of cotton. J.Biol.control,(1) 66-67.

5. Alice D., and A.V.Rao 1987. Antifungal effects of plant extracts on Drechelera oryzae in rice. IRRN,12(2).

6. Alice, D., and M.Subramanian, 1987. Effect of Azospirillum on ASD 16 rice. IRRN,12(3): 53.

7. Eswaramurthy, S., C.M.Pappiah, M. Muthusamy, S.Muthusamy, V.Mariappan, R.Jeyasekar, S.Natarajan, P.M.M.David and P.Gomathinayagam, 1988. Chemical control of back and fruit rot of chillies. Pesticides,22:38-40.

8. Eswaramurthy, S., C.M.Pappiah, P.M.M.David, P.Gomathinayagam, M.Jayasekar and S.Natarajan, 1986. Control of powdery mildew and Alternaria leaf spot of chillies. South Indian Hort.,34(4): 279-281.

9. Gopalaswamy, G., and P.Vidhyasekaran, 1987. Effect of method of applying Azospirillum brasilense on rice yield. IRRN,12(4):49.

10. Kalaimani, T., P.Padmanabhan, S. Ponniah and S.Natarajan, 1987. Evaluation of sugarcane varieties for resistance to smut caused by Ustilago scitaninea syd.Bharatiya Sugar,12(10):57-60.

11. Kalaimani, T., P.Padmanabhan, S.Ponniah and S.Natarajan,1987. Valuation of sugarcane varieties for resistance to redrot caused by Colletotrichum falcatum went. Co.op sugar,16(3):35-38.

12. Jayasekhar, M. and R.Rajasekaran, 1986. Appraisal of yield loss in groundnut due to rust and late leaf spot. Madras Agric. J., 73(9): 525-527.

13. Jayasekar, M. and M.N. Prasad, 1986. Effect of levels of Potassium and nitrogen on pectinolytic and cellulolytic enzymes and Sarocaladium oryzae (saw) Gam inoculation in rice. J.Potassium Res., 2(4): 144-147.

14. Lakshmanan, P., and S.Mohan, 1986. Control of tip over disease of cavendish banana. South Indian Horticulture, 35:336-337.

15. Lakshmanan, P., L.Mohan, S.Mohan, and R.Jeyarajan, 1987. A new leaf spot disease of sorghum cause by Cocbliobolus biolour in Tamil Nadu, India. Plant Disease, 71:651.

16. Lakshmanan, P., P.Selvaraj, and S.Mohan, 1987. Efficacy of different methods for the control of banana disease. Tropical Pest Management, 33: 373-376.

17. Lakshmanan, P., S.Palanisamy, and R.Jeyarajan, 1986. Sources of some resistance to sugary disease of sorghum in Tamil Nadu, India. Bulletin of Pure and Applied Sciences, 5B:74-76.

18. Lakshmanan, P., S.Palanisamy, and R.Jeyarajan, 1986. Reaction of sorghum germplasm to rust disease. Sorghum Newsletter, 29:4-5.

19. Lakshmanan, P., S.Palanisamy and L.Mohan, 1986. Host range of sorghum downy mildew in Tamil Nadu, India. Sorghum Newsletter, 29-81.

20. Lakshmanan, P., A.Chandrasekaran, and S.Palanisamy, 1986. Chemical control of sugary disease of sorghum. Sorghum Newsletter, 29-81.

21. Lakshmanan, P., and M.C.Nair, 1986. Survival of R.solani causing sheath blight of rice under various conditions. Madras Agric. J. 73:321-324.

22. Lewin, H.D. and P.Vidhyasekaran, 1987. Sources of resistance to sheath rot (Sh R) IRRN, 12(1) 8-9.

23. Mariappan, V., V.Narashimhan, S.Muthusamy and G.S.Kush, 1987. Reaction of IR lines to RTV. IRRN, 12:14-15.

24. Mohan, L. and R.Jeyarajan, 1986. Chemical control of ragi blast. Madras Agric.J., 73:709-710.

25. Mohan, L., P. Lakshmanan, N.Shanmugam, and R.Jeyarajan, 1986. A new sheath blight disease of pearl millet caused by Cocbliobolus bicolor. Science and Culture, 52:350-351.

26. Mohan, L., P.Manivasakam, S.Palanisamy and R.Jeyarajan, 1986. Screening for rust resistance in pearl millet MILWAI,5:14.

27. Mohan, L., P.Manivasakam, S.Palaniswamy and R.Jeyarajan, 1986. Response of pearl millet male sterile lines to diseases. MILWAI, 5:14.

28. Mohan, L., Lakshmanan, P. and R.Jeyarajan, 1987. Studies on a new sheath blight disease of pearl millet. Bulletin of Pure and Applied Science, 3:12.

29. Mohan, L., K.Sivaprakasam, S.Palanisamy and R.Jeyarajan, 1988. A new malady in ragi. MILWAI, 6:46.

30. Mohan, L., K.Sivaprakasam, S.Planiswamy and R.Jeyarajan, 1988. Response of pearl millet male sterile lines to Zonate leaf spot. MILWAI, 6:34.

31. Mohan, L., K.Sivaprakasam, S.Palaniswamy and R.Jeyarajan, 1988. Effect of direct sowing and transplanting on the incidence of downy mildew in pearl millet. MILWAI, 6:29.

32. Mohan, L., K.Sivaprakasam, and R.Jeyarajan, 1988. Interaction of downy mildew and sheath blight of pearl millet. MILWAI, 6:32.

33. Mohan, L., K.Sivaprakasam, S.Palaniswamy, and R.Jeyarajan, 1988. Variation in morphology and formation of sclerotia of Claviceps fusiformis. MILWAI, 6:33.

34. Narasimhan, V., V.Mariappan, S.Muthusamy and S.Rajasekaran, 1987. Screening for resistance to Tungro (RTV). IRRN,12:6.

35. Padmanabhan, P., and T.Kalaimani, 1987. Occurrence and chemical control of sugarcane red stripe in Pondicherry. Indian Sugar, 3(3): 135-138.

36. Venkata Rao. A., and Thangamani Narayanaswamy, 1988. Role of Nigrospora oryzae (Berks and Br) Petch in blast lesions of rice caused by Pyicularia oryzae cav. Curr.Sci. 57.272-273.

37. Vidhyasekaran, P., K.Saivaraj, H.D., Lewin and S.Chelliah, 1987. Reaction to IR and ADT varieties to green leaf hopper and Tungro (RTV). IRRN, 12(5).

38. Vidhyasekaran, P. and H.D. Lewin 1987. Time of spraying to control sheath rot (SH R). IRRN,12(6):6.

39. Vijayaraghavan, H., N.Ramdoss. T.Ramanathan, and P.Rethinam, 1987. Effect of toddy tapping on Thanjavur wilt disease of coconut. Indian Coconut J.,17(12):3-5.

Seed Technology

1. Balamurugan, P., C.Udayasooriyan and A.Chamy, 1987. Influence of irrigation methods on seed yield and its attributes in sunflower. Seeds & Farms, 13(12):40-44.

2. Blamurugan, P., A.Gopalan and C.Udayasooriyan, 1987. Sunflower seed production-An unique method. Seeds & Farms,13(2):38-39.

3. Balashanmugam, P.V., K.Vanangamudi, S., Thirumurthi and A.Chamy, 1987. Additional application of fertilizer and yield of onion as intercrop. Seeds & Farms,XIII(9):21-22.

4. Jayaraj, T., and T.V.Karivaratharaju, 1987. Estimation of pesticide residue in sesame seeds. Madras Agric.J.,73(4):181-87.

5. Karivaratharaju, T.V., and K.Vanangamudi, 1987. Importance of seed health in paddy seed production. Seeds and Farms,XIII(6): 28-29.

6. Palanisamy, V., and T.V.Karivaratharaju, 1987. Studies on seed development and maturation in annual moringa. Veg.Sci., 12(2):74.

7. Palanisamy, V., K.Vanangamudi and M.Jayabharathi, 1986. Seed development and maturation in cowpea. Tropical Grain Legume Bulletin, 33: 24-26.

8. Ponnusamy, A.S., K.Vanangamudi, T.V.,Karivaratharaju and K.Siddheswaran, 1987. Seed yield and quality of Kovilpatti tall sorghum hybrid in relation to date of sowing under rainfed conditions. Seed & Farms,XIII (3):22-24.

9. Vanangamudi, K., and T.V.Karivaratharaju, 1987. Growth analysis in certain varieties of pigeon peas. Indian J.Physiol,(1):123.

10. Vanangamudi, K. and T.L.Baskaran, 1987. Black eyed seeds of chilli (Capsicum annuum L.)Seeds & Farms,XIII(8):43-44.

11. Vanangamudi, K.V.Palanisamy, P.Natesan and T.V.Karivaratharaju, 1988. Variety determination in rice-examination of the hulled grain. Seed Sci & Technol.,16:41-46.

12. Vanangamudi, K., V.Palanisamy and P.Natesan, 1988. Variety determination in rice-phenol and potassium hydroxide tests. Seed Sci. & Technol.,16:47-51.

13. Vanangamudi, K., 1986. Seed storage studies in cowpea. Tropical Grain Legume Bulletin,33:11-13.

14. Vanangamudi, K. and T.V.Karivaratharaju, 1987. Influence of pre-storage seed treatments and storage containers on field emergence and vigour potentials of field bean. Seed Research, 15(1):16-19.

15. Vanangamudi, K., Mallika Vanangamudi, K. Balakrishnan and T.V.Karivaratharaju, 1986. Growth analysis in certain cultivars of redgram. Indian J. Pl.Physiol.XXX(1):123-125.

16. Vanangamudi, K., V.Palanisamy and T.V.Karaivaratharaju, 1987. Impact of seed crop management practices on drymatter accumulation and seed yield in bajra. Seeds & Farms,XIII(3):15-19.

17. Vanangamudi, K., V.Palanisamy and T.V.Karivaratharaju, 1987. Relationship between phytomass and harvest index in maize genotypes. Seed & Farms,XIII(3):20-21.

18. Vanangamudi, K., V.Palanisamy and K.Siddheswaran, 1987. Seed production technology in cucurbit. Seed & Farms,XIII(3): 49-51.

19. Vanangamudi, K., K.M.Sundaram, Mallika Vanangamudi., K.Balakrishnan and N.Natarajaratnam, 1987. Influence of moisture stress at critical stages of crop growth on seed quality of groundnut cultivars. J.Oilseeds.Res., 4:9-12.

20. Vanangamudi, K., V.Palanisamy, A.S.Ponnusamy and T.V.Karivaratharaju, 1987. Quality seed production of cotton. Seeds & Farms,XIII (6):30-33.

Soil Science and Agrl.Chemistry

1. Devaraj R., V.Jayabal, M.Balusamy and S.Chockalingam, 1987. Studies on the possibility of increasing germination, yield and quality of sugarcane. Bharatiya sugar,12(12) 43-48.

2. Duraisamy, P., G.V.Kothandaraman and S.Chellamuthu 1986. Availability and uptake of nitrogen and phosphorus as influenced by amendments and zinc in alkali soil. Madras Agric.J.,73(1): 46-52.

3. Duraisamy, P., G.V.Kothandaraman and S.Chellamuthu, 1986. Response of rice (Var.Bhavani) to amendments and zinc in alkali soil. Madras Agric.J.,73(2):112-114.

4. Duraisamy, P., G.V.Kothandaraman and S.Chellamuthu, 1986. Effect of amendments and zinc on chemical properties of alkali soil. Madras Agric.J.,73(3):129-133.

5. Mahimairaja, S., J.Helkiah and A.Gopalaswamy, 1986. Long term effect of graded doses of fertilizers and manures on soil physical conditions. Madras Agric.J.,73(6):340-347.

6. Mahimairaja, S. and K.Mayalagu, 1986. Effect of graded levels of phosphorus and iron on rice under two moisture regimes. Andhra Agric.J.,23(2):182-184.

7. Mahimairaja, S. and K.Mayalagu,1986. Effect of combined application of phosphorus and iron on available phosphorus in soil. Andhra Agric.J.,33(4):326-329.

8. Mathan, K.K., A.Gopalswamy, R.P.Gupta, S.Mani, S.Mahimairaja and R.Natesan, 1985. Compaction technology for fluffy paddy soil. Madras Agric.J.,72(11):613-618.

9. Mathan, K.K.,R.Natesan, V.Ravikumar and A.Gopalswamy, 1986. Studies on the influence of amendments on the soil surface crusting. Madras Agric.J.,73(7):394-397.

10. Murugappan, V., R.Nagarajan, S. Subramanian, S.K.Soundararajan, S.Lakshminarayanan, A.Dhanapalan Mosi and T.S.Manickam, 1988. A new proposal for prescribing fertilizer recommendation to crops. Fert.Marketing News,19(2):9-17.

11. Muthuswamy, P.,R.Natesan and A.Narayanan, 1986. Response of cowpea to application under rainfed condition. Madras Agric. J.,73(5):268-270.

12. Rani Perumal., P.Duraiswamy, C.Jayaraman, T.S.Manickam and G.V.Kothandaraman, 1986. P and K fertilization on rice yield and N efficiency as influenced by added N.Madras Agric.J.,73 (4):221-225.

13. Rani Perumal, M.Velayutham and Dhanapalan Mosi, 1986. Forms of soil nitrogen and available nitrogen status in relation to rice nutrition in alluvival soils., Thanjavur District. Madras Agric.J.,73(3):140-145.

14. Saravanan, A., V.Velu and K.M.Ramanathan, 1987. Effect of combined application of bio-organic and chemical fertilizer on physico-chemical properties, N transformation and yield of rice in submerged soils of Cauvery delta. Oryza, 24:16.

15. Saravanan, A., V.Velu and K.M.Ramanathan, 1987. Ammonia volatilization loss in rice soils of Cauvery delta. IRRN,12(4):59.

16. Velu, V., A.Saravanan, and K.M.Ramanathan, 1986. Effect of NPK fertilizers on changes in the available nutrient content in a submerged rice soil. Oryza, 23:226.

Statistics

1. Dhamu, K.P., S.Varadharajan, M.Murugesan and A.Shanmugasubramanian, 1987. Significance of Intercept in Multiple Regression Analysis. Rural Development Review,6 (1 and 2):533-541.

Horticulture

1. Balakrishnan, K., D.Veeraragavathatham and S.Sundararajan, 1986. Seed Development and maturation in winged bean (Psophocarpus tetragonalobus L.). South Indian Hort.,34(6):395-396.

2. Balashanmugam, P.V and N.Chezhiyan, 1986. Effect of differential application of nitrogen on growth and yield of turmeric (Curcums longa L). Madras Agric.J.,73(8):439-442.

3. Balashanmugam, P.V. K.G.Shanmugavelu, and S.Thamburaj, 1986. Association of metric traits to yield in pole beans (Phaseolus vulgaris L.). South Indian Hort.,34(b):419-420.

4. Chezhiyan, N., K.Nanjan and MD.Abdul Khader,1986. Effect of spacing and pinching chrysanthemum, South Indian Hort.,34 (6):2.

5. Chezhiyan, N. 1986. Studies on pollen germination of guava and its relatives. Madras Agric.J.,73(9):501-506.

6. Chezhiyan,N. 1986. Blossom biology of guava and its relatives. Madras Agric.J., 73(11):636-638.

7. Chezhiyan, N., K.Nanjan and MD.Abdul Khader, 1986. Nutrient requirements of chrysanthemum cv Co.1. South Indian Hort,34(3): 173-178.

8. Chezhiyan,N., S.Jayashanker, MD.Abdul Khader and K.Nanjan 1986. Vegetative propagation of Gutterda speciosa. South Indian Hort., 34(4):284-285.

9. Jawaharlal, M., S.Sundararajan and D.Veeraragavathatham, 1986. Studies on the mode of application of zinc and iron on the growth and yield of onion Allium cepa Var-cepa. South Indian Hort.,14(4):234-239.

10. Jayasankar, S. and I.Irulappan, 1986. Components of variance and degree of dominance for yield contributing traits in chilli. (Cepsicum annuum L.). South Indian Hort., 34(2):74-81.

11. Jayasankar,. S., I.Irulappan and R.Arumugam, 1986. Range, Mean performance and residual heterosis of F2 intervarietal. crosses in chilli (Capsicum annuum L.) South Indian Hort.34(2)74-81.

12. Ponnuswami, V., N.Chezhiyan, S.Thamburaj, MD. Abdul Khader and P.Rangaswamy, 1986. Biometric studies in Nerium oleander. L. South Indian Hort., 34(5):358-59.

13. Semanthini Ramadoss and M.Kader Mohideen, 1988. An overview of pepper cultivation in Tamil Nadu, cardamom,XXI(1):9-11.

14. Singh U.C., S.Sundararajan and D.Veeraragavathatham, 1986. Effect of split application of nitrogen on certain mineral nutrient content of clipping amaranthus (Amaranthus tristis L.) C.CO.3. South Indian Hort.,34(5):341-342.

15. Subbiah, K. and S.Sundararajan, 1986. Nitrogen and phosphorus interaction on the yield of CO 3 tomato. South Indian Hort., 34(5) : 343-349.

16. Sundararajan, S., and D.Veeraragavathatham, 1986. CO 2 Snake-gourd. South Indian Hort., 34(1):59.

17. Thamburaj, S., C.R.Muthukrishnan and I.Irulappan, 1986. Promising mutatants in Cassava (Manihot esculenta Crants). South Indian Hort., 33(4): 253-256.

Agricultural Engineering

1. Kumar V.J.F., 1987. Effect of weeder design on operation. Proc. AMA 18(4).

2. Manian R., V.J.F.Kumar and V.M.Duraiswamy, 1987. Seed planters for sowing groundnut. Agricultural Engineering Today, 11(5).

3. Manian, R., K.Natarajamurthy, G.Chinnan Chetty and V.J.F.Kumar, 1987. Evaluation of IRRI rice transplanter in clay loam soil conditions. J.Agric.Eng.,24(2):127-137.

4. Sreenarayanan, V.V., 1987. Development of Agricultural waste-fuelled metal bin dryer. RNAM Newsletter,(Phillipines) 30.

5. Tajuddin, A. and R.Karunanithi. 1987. An animal drawn improved iron plough. Agricultural Engineering Today,11(2):4.

6. Tajuddin, A., R.Karunanithi and T.V. Job, 1987. Development of a vertical conveyor paddy reaper for harvesting fodder crop. Agricultural Engineering Today,2(4):33-36.

7. Tajuddin, A., and R.Karunanithi, 1987. A device for broadcasting fertilisers and seeds. Agricultural Engineering Today,11(2):13.

8. Tajuddin, A., and R.Karunanithi, 1987. An animal drawn iron plough as an alternative to the indigenous plough. Agricultural Mechanisation in Asia, Africa and Latin America,18(4):57-60.

9. Tajuddin, A., S.Mohan and R.Karunanithi, 1987. Insect control without insecticides. Invention intelligence,22(12):494-495.

Water Technology-Coimbatore

1. Kulandiaivelu, R., V.B.Banumurthy and R.M.Panchanathan, 1986. Climatic classification of Tamilnadu. Madras Agric.J. 73(9).

2. Mohandass, S., 1986. Effect of some growth regulants on growth and flowering behaviour in Pyrethrum (Chrysanthemum cinerarifolium Linn). Madras Agric.J.,73:281-283.

3. Bhanumurthy, V.B. and R.Kulandaivelu, 1986. Average rainfall of Coimbatore district. Madras Agric.J.,73(5):244-246.

4. Ramaswami, C., 1988. Metribury is an useful herbicide in sugarcane fields. Pesticides, 21-22.

5. Siddeswaran. K., and C.Ramaswami, 1987. Intercropping and border cropping of compatible crops in finger millet under gardenland cultivation. J.Agronomy and Crop Science,178,246-249.

6. Palchamy, A., S.D.Sundersingh and A.Rajagopal, 1987. Water management in pure and intercropped cotton (MCU-9) crop. Madras Agric J.,75(11):655-56.

7. Ilangovan, M., R.Kulandaivelu and M.Panchanathan, 1987. Soil and climate based irrigation schedules for rice. IRRN,12(2):36

8. Marimuthu, R. and R.Kulandaivelu, 1987. Irrigation management of low land rice under water constraint. IRRN,12:1.

Veterinary and Animal Sciences

1. Sivaselvam, S.N. and R.Prabaharan, 1987. A study on cost of production of frozen semen in Tamil Nadu Cheiron,16(4):141-144.

2. Sivaselvam, S.N. and R.Prabaharan, 1987. A study on cost of production of liquid semen (white cattle) in Tamil Nadu. Indian Journal of Dairy Science,40(9).

Animal Genetics

1. Chandra Reddy, V.R., and A.R.Krishnan, 1987. Influence of erythrocyte glutathione (GHS) and blood potassium types of ewes' on their lamb mortality. Ind.Journal Animal Science, 57(6): 596.

2. Chandra Reddy, V.R., and A.R.Krishnan, 1987. Genetic association between types of erythrocyte Glutathione and blood potassium in sheep. Ind.Journal Animal Science,57(9):1010.

3. Karunanithi, K., U.S.Krishnamurthy, A.R.Krishnan, John Edwin. V.Thiagarajan and A.Mahalinga Nainar, 1987. Studies on preservability and freezability of buffalo semen in different extenders. Cheiron,16:2.

4. Mohan, M., V.Ulaganathan, I.M.Rodricks., C.K.Bhuvanakumar, and M.Iyue, 1986. Reproduction rate and viability of Merino, Nilgiri and half bred Merino. II. Age specific replacement rate and net reproduction rate. Tropical Animal Health Production,18: 177-185.

5. Panneerselvam, S., and A.R.Krishnan, 1987. Serum alkaline Phosphatase polymorphism in Madras Red and Mandya sheep. Cheiron, 16:(2): 60-64.

6. Rahumathulla, P.S., C.K.Bhuvanakumar and S.Balachandran., 1987. Effect of season on litter size in rabbits. Indian Vet.J. 64:932-934.

7. Rahumathulla, P.S., R.Sankarasubramanian, K.Gajendran and E.Ebnezer Raja, 1987. Influence of sire and season on conception rate in buffaloes. Indian Vet.J.64:485-487.

8. Rahumathulla, P.S., R.Sankarasubramanian, K.Gajendran and R.V.Suresh, 1987. Studies on the influence of the sire and the effect of season on conception rate in cattle. Cheiron 16(1): 27-30.

9. Ramachandran, B.V., V.Ulaganathan and N.Natarajan, 1987. Incidence of inbreeding and its effect on first parity records in a Sindhi herd. Cheiron,16(6):249-253.

10. Sethumadhavan, V., Thiagarajan, K.R.Parthasarathy and V.Ulaganathan, 1986. Karyological abnormalities in a leaukaemia shebuffalo. Cheiron,15(6):227-230.

11. Sedhumadhavan, V., V.Thiayagarajan and V.Ulaganathan 1987. The karyotype of Toda buffaloes. Cheiron,16:37-39.

Animal Nutrition

1. Doraisamy, K.A., and J.Ernest, 1986. Aflatoxin content in market samples of certain oil cakes. Kerala J.Vety.Sci.118.

2. Murugan, M. and V.Kathaperumal, 1987. Utilisation of tree fodder in sheep. Indian Journal of Animal Sciences,57(10): 1145-1147.

3. Murugan, M., R.Ravi and V.Kathaperumal, 1987. Macro and micro mineral content in certain tree leaves of Tamil Nadu. Indian Journal of Nutrition,4(2):126-128.

4. Murugan,M., and VKathaperumal, 1987. Nutritive evaluation of Vagai (Albizia lebeck) leaves for goats. Indian Journal of Animal Nutrition,4(1): 61-62.

5. Selvasubramaniam, S., D.Chandrasekaran, K.Viswanathan, C.Balasubramanian, N.Punniamoorthy and C.Veerapandian 1987. Surveillance of Aflatoxin B1 in various livestock and poultry feeds. Indian Vet.J., 64:1033-1034.

Clinics

1. Manickam, R., and M.Mohan, 1987. Seroepidemiological studies on Infectious bovine rhanotracheitis (IBR) Viral abortion in Cows. Indian J. of Anim.Sci.,57(9):959-962.

2. Rajan, T.S.S., and V.D.Padmanabhan, 1987. Diagnosis of Rabies with glycosuria in herbivores. Indian Veterinary Journal,64:274-275.

Dairy Science

1. MohammedHabibullah Khan, M. and N.Natarajan, 1986. Incidence of aerobic spore formers in milk. Madras Agric.J.,73(10):570-572.

2. Mohammed Habibullah Khan and N.Natarajan, 1986. Biochemical changes in Milk by Bacillus cereus cells·Madras Agric.J.,73(37): 166-169.

3. Mohammed Habibullah Khan, M. and N.Natarajan, 1986. Influence of certain chemical factors in Germination of spore cells of Bacillus cereus. Madras Agric.J.,73(9):510-516.

4. Nareshkumar, C. and P.S.Krishnamoorthy., 1987. Studies on the determination of solids not fat in cow milk by rapid method. Cheiron, 16(1):23-26.

Meats

1. Kosalaraman, V., 1986. A Design for hanging rack for dressed poultry. Cheiron, 15:6.

2. Radhakrishnan, K.T., 1987. The yield and proximate composition of sheep slime meal. Kerala J.Vet.Sci.,18:27.

Pathology

1. Panneerselvam, S., and D.Narahari., 1987. A study on mortality pattern in commercial layer farms. Cheiron,11:104-108.

2. Parthasarathy, K.R., and M.A.Rasheed, 1986. Lymphoid leukaemia in a she-buffalo. Cheiron ,15(6):235-237.

Pharmacology

1. Jayasekaran Samuel, J., K.B.S. Mani., Inbaraj cyrus., and R.Natarajan, 1987. Studies on the use of synthetic atropine substitutes in organophosphorus pesticide poisoning. Cheiron, 16(3):135-136.

Physiology

1. Nanjappan, K., and R.Govinda Rao., 1987. Rumen metabolism studies in goats with protected feed. Cheiron,16(5):205.

Department of Poultry Science

1. Babu, M., D.Thyagarajan, R.Prabakaran and V.Sundararasu, 1988. Performance of Austra White pullets in cages. Indian Poultry Review, 29(7):41-42.

2. Magbool Ahmed, D.Thiagarajan, and V.Sundararasu, 1987. Vaccine and its role in production of immunity. Poultry Guide,24(9):75-76.

3. Ramakrishna, J., J.Kalatharan, D.Thiagarajan, and V.Sundararasu, 1987. Incidence of intussusception in poultry. Indian Poult.Review,29.

4. Ramakrishna, J., A.Thangavel, K.Abdul Mujeer and V.Sundararasu, 1987. Effect of vetroliv on broiler performance., Poult. Adviser., 20(7): 63-64.

5. Ramakrishna, J., D.Thiagarajan, J.Kalatharan, K.Abdul Mujeer and V.Sundararasu, 1987. Incidence of Fatty liver syndrome. Poultry Punch, 3(10): 75-78.

6. Ravindran, R., D.Narahari and D.Thiagarajan, 1987. Relative economy of forced moulting of layer. Indian Poultry Review,29 (5): 31-35.

7. Thiyagarajan, D., P.Kothandaraman, J.Ramakrishna, N.Ramamurthy, A.Thangavel and V.Sundararasu, 1988. Influence of Step down and Step up Lighting programme on Layer Economy. Indian Poultry Review, 19(10): 35-37.

8. Thiagarajan, D., D.Narahari, P.Kothandaraman and Ebenezer Raja, 1987. Relative efficacy and economy of certain anticoccidial drugs in broiler. Cheiron,16(6):223-233.

9. Thiagarajan, D., D.Narahari, P.Kothandaraman and E.Ebenezer Raja, 1987. The effect of four different Anti-Coccidial agents in experimental Caecal coccidiosis in chicken. Kerala J.Vet. Sci., 18(2): 31-36.

Obstetrics and Gynaecology

1. Asokan, S.A., S.R.Pattbiraman and V.Venkatasamy, 1987. Carnitine and Glycaryl Phosphoryl chlorine levels and quality of semen in crossbred bulls. Livestock Adviser, XII,9.

2. Devanathan, T.G. and Syed Abdul Quayam, 1987. Induction of parturition inducing Dexamethasone in cattle suffering with cervico vaginal prolepsy. Cheiron,16(5):220-222.

3. Devanathan, T.G., Syed Abdul Quayam and S.R.Pattabiraman, 1987. Ovarian activity and Uterine in volution during postpartum period of Murrah She buffaloes. Ind.Vety.J.,64:779-780.

4. Nagarajan, V., B.Neduncheralathan, D.Kathiresan, Syed Abdul Quayam and T.M.Thangaraj, 1987. Incidence of Terbal abnormalities in she buffalo . Cheiron,16(3):137-140.

5. Neduncheralathan, B., D.Kathiresan, S.R.Pattabiraman and Syed Abdul Quayam, 1987. Critical Post-operation care of bovines. Livestock Adviser, XII - 47-49.

6. Radhakrishnan, V. and S.R.Pattabiraman, 1987. Cytohormonal Indices in induced single or multiple ovulation in cattle. Cheiron, 16:86-90.

7. Radhakrishnan, B. and S.R.Pattabiraman, 1987. Studies on *induced oestrus in cattle following cloprostenol* and serum Gonadotrophin treatments. Indian Vet. J., 64:44-47.

8. Radhakrishnan, B. and S.R.Pattabiraman, 1987. Effect of induced single or multiple ovulation on biochemical and enzyme constituents of oestrus mucus in cows. Indian Vet. J.,64:142-145.

9. Ramesh Kumar, B., R.C.Rajasundaram and A.C.Subramanian, 1987. Mucometra in a crossbred heifer. Indian Veterinary Journal,522-523.

10. Seshagiri, V.N., S.R.Pattibiraman and A.R.Krishnan, 1987. Incidence of sperm agglutinating antibody in regular and repeat breeding crossbred cows. Cheiron,16(4):152-154.

11. Subramanian, A. and S.R.Pattabiraman, 1988. Exfoliative vaginal *cytology in Bovines. Indian J. of Animal Sciences,58:209-211.*

12. Syed Abdul Quayam, T.G.Devanatham, and S.R.Pattabiraman, 1987. Variation in serum calcium, Phosphorus, Magnesium level during pre, peri and post partum periods in She-buffaloes. Cheiron, 16(1): 8 - 14.

13. Syed Abdul Quayam, T.G.Devanathan and S.R.Pattabiraman, 1987. Observation on Milk yield and body weight relationship with estrus occurrence in she-buffalo. Indian Journal of Animal Reproduction 8:4-5.

14. Syed Abdul Quayam, T.G.Devanatham and S.R.Pattabiraman, 1988. Studies on influence of mineral biochemical and Haematological concentration at 5 days post partum and on the occurrence of post partum estrus in she buffaloes. Indian Vety. Jour. 65(3).

15. Syed Abdul Quayam, T.G.Devanathan, M.Iyue, N.Kandasamy and N.Natarajan, 1987. Effect of progesteron in Anoestrus Ewes during breeding season. Cheiron,16(5):223-224.

16. Veerapandian, C., K.S.Narasimhan, Syed Abdul Quayam and S.R.Pattabiraman, 1987. Variation in certain biochemical constituents in the blood anaestrus buffaloes maintained under farm and urban conditions. Cheiron,16:19-22.

Surgery

1. Rameshkumar, B., and E.I.Rajendran, 1987. A Comparative study of certain suture materials for experimental tenorrhaphy in buffaloe calves. Cheiron,16(2):54-59.
2. Thilagar, S. 1987. Congenital pyloric stenosis and its surgical management in a dog-case report. Indian Journal of Veterinary Surgery, : 9(1).
3. Thilaqar, S. 1987. Patellectomy for a case of patellar fracture in a dog. Kerala Veterinary Science: 18(2).

Fisheries College, Tuticorin

1. Felix, S. and N.Sukumaran, 1987. Breeding of fighter fish-a boon to aquarium keepers. Fishing Chimes,7(6):27-29.
2. Felix, S. and N.Sukumaran, 1987. Aquarium keeping an art. Aquaworld, 2(6): 1988.
3. Kutty M.N. and N.Sukumaran, 1988. Thermal pollution and fly ash wastes-the possible effects on acquatic life. Aquaworld,3 (2) : 57-58.
4. Natarajan, P. and S.Felix, 1987. Effects of infestation on the freshwater fish, Mystus quio. Aquaculture,67 (1&2):233-235.
5. Santhanam, R., P.Gopalakrishnan and G.Jegatheesan, 1987. Culture of seaweeds in brackish waters-a new and promising technology. Fishing Chimes,7(2):4.
6. Santhanam, R., P.Velayutham and G.Jegatheesan, 1987. Prospects of Indian seaweeds. Aquaworld,2(11):343.
7. Santhanam, R., P.Velayutham and G.Jegatheesan, 1987. Blood-worms-their culture and prospects. Fishing Chimes,7(7):69.
8. Sukumaran, N., K.Venkateramanujam and M.N.Kutty, 1987. Growth of common carp hatchlings in a sewage effluent. Fishing Chimes,7(6):25-27.
9. Sukumaran, N. and K.Venkataramanujam, 1987. Polyculture of finfishes in brackishwaters. Aquaworld,2(12):401-402.
10. Sukumaran, N. and M.N.Kutty, 1987. Energy utilisation of freshwater mullet, Rhinomugil corsula (Hamilton) under exercise. Proc.Indian Acad.Sci., 96(6):705-715.

11. Velayutham, P., G.Jegatheesan and R.Santhanam, 1987. Fish sauce, a promising by product. _Fishing Chimes_,6(12):64

12. Velayutham, P. and R.Santhanam, and G.Jegatheesan, 1987. Multi-farious uses of algae._Aquaworld_,2(9): 301-302.

13. Venkataramanujam, K., V.Ramadhas and B.Srikrishnadhas, 1987. Stranding of sperm whale, _Physeter catodon_ Linneus at Manapad, Palk Bay. _Investigations on Cetacea_,20:253-256.

14. Venkataramanujam, K., R.Senthilathiban and N.Sukumaran, 1988. Benefits of fish foods. _Aquaworld_,3(1):17.

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		Thiru K.V.Ramachandran (from 10.3.88 to 31.3.88)
Director (Seed Certification)	:	Thiru P.Manickavasagam

Heads of Departments

1. Dr. M.Subramanian
   Professor and Head
   Department of Agrl.Botany
   Agrl.College & Res.Institute
   Madurai.

2. Professor K.R.Swaminathan
   Professor and Head
   Dept.of Farm Machinery
   College of Agrl.Engg.,
   Coimbatore.

3. Dr.A.Sundararaj
   Professor and Head
   Department of Pathology
   Madras Veterinary College
   Madras 600 007.

4. Dr.V.Meenakshisundaram
   Professor and Head
   Dept.of Agricultural Economics
   Coimbatore 3.

5. Dr.N.Raghavan
   Professor of Preventive Medicine
   Madras Veterinary College
   Madras

Non-Official Members

1. Thiru W.P.A.R. Rajaram
   Planter
   Pattiveeranpatti
   Madurai District.

2. Dr.Y.B.Morachan
   Pammal House
   29, G.V.D.Layout
   Subramaniapuram
   Coimbatore

3. Thiru V.R.Muthuveerappan
   Annamalai University
   Annamalai Nagar.

4. Thiru S.Pandiperumal
   22.4, Meenal Illam
   Vanasankari Yadav Street
   Ramanathapuram
   623 501.

5. Dr.S.Rajamani
   AL 97, 11th Main Road
   Anna Nagar
   Madras.

EXTENSION EDUCATION COUNCIL

Chairman		
Vice-Chancellor	:	Dr.V.Rajagopalan
Member - Secretary		
Director of Extension Education	:	Dr.S.Sankaran (upto 10.8.87 and incharge from 11.8.87 to 8.3.88)
		Dr.N.Shanmugam (from 9.3.88)
Members		
Official Members		
Registrar	:	Dr.N.Shanmugam (upto 8.3.88)
		Dr.A.Narayanan (from 9.3.88)
Dean (P.G.Studies)	:	Dr.V.D.Guruswamy Raja (upto 31.1.88)
		Dr.T.K.Kandaswamy (incharge from 1.2.88 to 29.2.88)
		Dr.G.Kothandaraman (from 29.2.88)
Dean (Agri) Coimbatore	:	Dr.V.D.Guruswamy Raja (incharge from 1.4.87 to 6.8.87)
		Dr.T.Kandaswamy (from 7.8.87)
Dean(Hort) Coimbatore	:	Dr.K.G.Shanmugavelu
Dean(Engg) Coimbatore	:	Dr.V.Subramaniyan (from 1.4.87 to 29.2.88)
		Prof.K.R.Swaminathan (from 1.3.88)
Dean, Agricultural College & Res.Institute, Madurai	:	Dr.T.Kumaraswami (from 1.4.87 to 30.4.87)
		Dr.S.Neelakantan (incharge from 1.5.87 to 4.8.87)
		Dr.T.S.Manickam (from 5.8.87)

Dean, Agricultural College Killikulam	:	Dr.T.K.Kandaswamy (from 1.4.87 to 4.8.87) Dr.G.Soundarapandian (from 5.8.87)
Dean, Madras Veterinary College, Madras	:	Dr.P.Kothandaraman (from 1.4.87 to 31.1.88) Dr.MP.Arumugam (incharge from 1.2.88)
Dean, Veterinary College Namakkal	:	Dr.R.Ramamurthi
Dean, Fisheries College Tuticorin	:	Dr.G.Jegatheesan
Director, Tamil Nadu Rice Res.Institute, Aduthurai	:	Dr.S.Chelliah
Director, Water Technology Centre, Coimbatore	:	Dr.P.Kandaswamy
Director of Research	:	Dr.M.Balasubramanian
Director,CARDS,Coimbatore	:	Dr.A.Kandaswamy
Director, School of Genetics, Coimbatore	:	Dr.S.R.Sree Rangasamy
Director, Centre for Plant Protection Studies, Coimbatore	:	Dr.S.Jayaraj
Director, Centre for Soil and Crop Management Studies, Coimbatore	:	Dr.S.Subramanian (upto 9.8.87) Dr.S.Sankaran (from 10.8.87)
Diréctor of Research (Animal Science) Coimbatore	:	Dr.P.Kothandaraman i/c (upto 6.8.87) Dr.T.M.Thangaraj (from 7.8.87 to 29.2.88) Dr.P.Richard Masillamony (from 1.3.88)
Director, Animal Health Tiruchirapalli	:	Dr.T.M.Thangaraj (upto 6.8.87) Dr.P.Mahalingam (from 7.8.87)

Director of Agriculture	:	Thiru N.Athimoolam,I.A.S., (upto 13.12.87)
		Thiru V.Viswanathan,I.A.S., (from 14.12.87)
Director of Horticulture and Plantation Crops	:	Thiru M.Mahalingam
Director of Agricultural Marketing	:	Thiru S.Balasubramaniam (upto 30.6.87)
		Thiru C.Sankaran (from 1.7.87 to 30.11.87)
		Thiru S.V.Ponnusamy (incharge from 1.12.87 to 16.3.88)
		Thiru A.V.Kalyanaraman (from 17.3.88)
Director of Animal Husbandry	:	Dr.C.Kalyanasundaram
Chief Conservator of Forests	:	Thiru S.Kondas, I.F.S., (upto 30.4.87)
		Thiru S.John Joseph, I.F.S., (from 1.5.87)
Chief Engineer (Agrl.Engg)	:	Thiru S.Savadamuthu
Chief Engineer (Agrl.Engg) River Valley Project	:	Thiru R.Kuppuraj
Director of Fisheries	:	Thiru V.Manivannan, I.A.S.,
Director of Oilseeds	:	Thiru C.Narayanan (1.4.87 to 31.12.87)
		Thiru D.Thamburaj (incharge from 1.1.88 to 9.3.88)
		Thiru K.V.Ramachandran (from 10.3.88 to 31.3.88)
Director (Seed Certification)	:	Thiru P.Manickavasagam

Heads of Departments

Dr.G.Perumal
Professor & Head
Dept.of Agrl.Extension &
Rural Sociology
TNAU., Coimbatore

Dr.Mohammed Habibullah Khan
Professor & Head
Dept.of Extension
Madras Veterinary College
Madras.

Dr.M.Muthiah
Professor & Head
Dept.of Agrl.Extension &
Rural Sociology
Agrl.College & Res.Instt.,
Madurai.

Special Invitee

Prof.S.V.Pandurangan
Professor & Head
Dept.of Extension
Annamalai University.

ERRATA

Page	Para	Line	Read	For
6	11	2	Combination	Coimbination
6	12	2	adoption	adoptian
10	Dean, PG	Middle entry	28.2.88	29.2.88
13	7	4 & 5	Collaborative	Collaborartive
13	7	5 & 6	Fisheries	Fisheies
15	5	1 & 2	Powers	Powwers
20	3	1	experience	experiance
21	8	4	Conventional	Oonventional
37	Last	3	Finance	Financial
40	5	7	Altogether	Altogethr
42	Heading	First para	Hostel	Hospital
42	6 Left side	3	Hostel	Hostal
42	8	1	Dr. S. Krishnamoorthy	Dr. S. Krishnamoorth
43	1	4	as	was
43	4	2	Organised	Organiaed
43	4	9	Coimbatore. One	Coimbatore one
45	4	8	Srivilliputhur and Vridhachalam	Srivilliputhur, Vridhachalam
49	Tabular statement under Total 3		3	25
49	Tabular statement under Total 4		62	6
53	2	2	508	500
54	1	4	Speeches	Speech
54	1	6	Occasion	Occasions
54	1	7	And	Any
54	9	6	Nominated as the	Nominated the
57	4	last but one	and.	and and
61	1	last	Dignitaries	Dignitories
61	2	14	Substantial	Substancial
63	5	4	viz TM 4305, T. M. 4307	Viz, T. M. 4307
71	4	3	postponement	post-ponement
73	1	5	Upto	Up to
78	7	5	District	Districts
80	2	6 to 8	*G. barbadense* (Suwin) were preferred to *G. arboreum* (K 8) by both bollworms	*G. herbaceum* (Tkho 4) and *G. arboreum* (K 8) by both bollworms